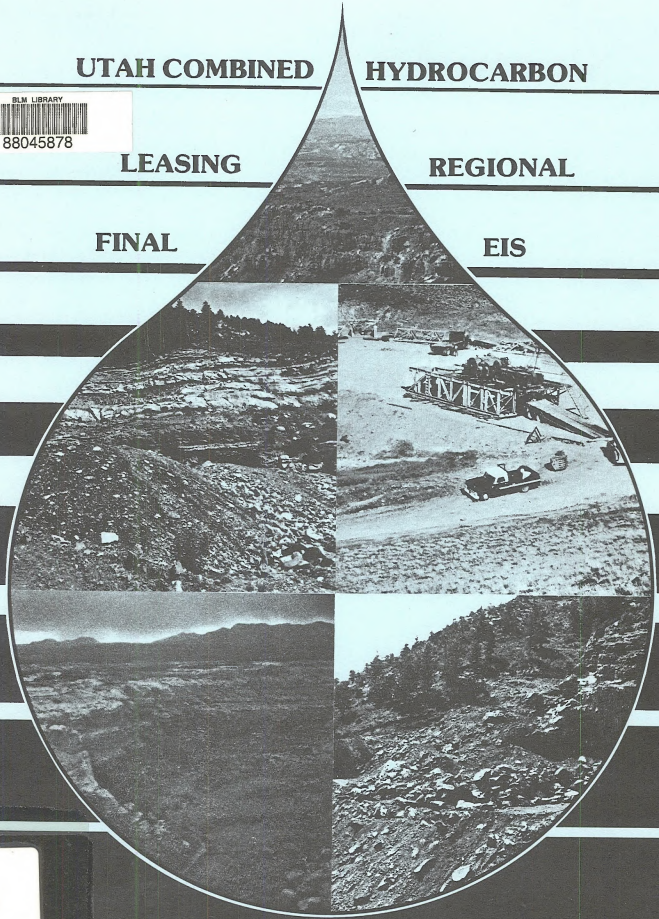
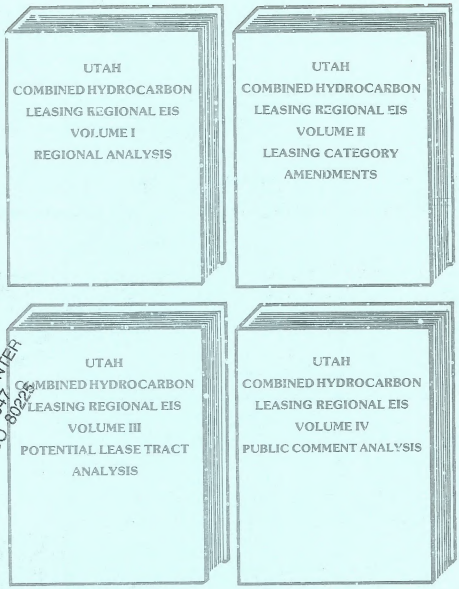
UTAH COMBINED HYDROCARBON LEASING REGIONAL FINAL EIS



VOLUME IV: PUBLIC COMMENT ANALYSES



Why Is This EIS Divided into Four Volumes?

This EIS is divided for ease of handling the volume of data involved and to clearly separate three levels of analyses plus public comment received on the Draft EIS. The first three volumes address a separate proposal and analyses, along with specific major Federal actions, required to implement the Combined Hydrocarbon Leasing Program in Utah.

What Does Each Volume of this EIS Contain?

Volume I contains the regional assessment for implementation of the Bureau of Land Management's Combined Hydrocarbon Leasing Program for Utah. This analysis examines high and low production levels and no action at various periods of time during a 20-year time frame. This volume serves as the regional assessment for all required site-specific Combined Hydrocarbon Lease EISs in Utah.

Volume II contains proposed planning amendments to update BLM's land use plans. These updates propose categories for issuing new leases or converting existing oil and gas leases to Combined Hydrocarbon Leases.

Volume III contains the site-specific assessment for issuing Combined Hydrocarbon Leases on potential tracts within Special Tar Sand Areas.

Volume IV contains public comments made on the Draft EIS, along with BLM responses to those comments.

UTAH COMBINED HYDROCARBON LEASING REGIONAL FINAL EIS

Volume IV

Public Comment Analyses

Prepared By:
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
RICHFIELD DISTRICT

Roland Robinson

State Director
Utah State Office

Cooperating Agency: State of Utah and National Park Service

Counties That Could Be Directly Affected: Carbon, Duchesne, Emery, Garfield, Grand, San Juan, Uintah, *Utah, Wasatch,* and Wayne, all in the State of Utah.

ABSTRACT: The Bureau of Land Management, under the Combined Hydrocarbon Leasing Act, is examining potential development alternatives for Special Tar Sand Areas in Utah. *This volume contains oral testimony and written comments received on the Draft EIS, along with responses to those comments.*

For Further Information, Contact: Alan Partridge, EIS Team Leader, Richfield District Office, Bureau of Land Management, 150 East 900 North, Richfield, Utah 84701, or call Commercial: (801) 896-8221 or FTS: 584-8011.

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Alan Partridge	Environmental Specialist	Team Leader	B.S. Botany	22
Ferris Clegg	Environmental Specialist	Technical Coordinator, Aquatic Animals, and T&E Species	B.S., M.A. Biological Science	20
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Roger Twitchell	Environmental Specialist	Vegetation, T&E Plants, Livestock Grazing, and Wild Horses and Burros	B.S. Botany	6
Richard Felthousen	Wildlife Biologist	Terrestrial Animals and T&E Animal Species	B.S. Natural Resource Development M.S. Wildlife Biology	8
John Branch	Geologist	Minerals, Geology, and Topography	B.S. Geology	5
Hal Hubbard	Geologist	Minerals, Geology, and Topography	B.S. Geology	31
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		Jim Piani	BLM, Utah State Office
Joel Pickelner	National Park Service	Earl Hindley	BLM, Utah State Office
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Chuck Horsburgh	BLM, Richfield District	Alan Partridge	BLM, Richfield District
Brad Palmer	BLM, Vernal District	Ron Bolander	BLM, Utah State Office
Lynn Jackson	BLM, Moab District		

LIST OF AGENCIES AND ORGANIZATIONS REQUESTED TO COMMENT ON THE *FINAL* EIS

BLM is requesting comments on this *Final* EIS from the agencies and organizations listed below. Comments from companies who expressed interest in leasing or applied for lease conversions are requested. All other interested and/or affected individuals, private groups, and agencies are also invited to comment.

Federal Agencies

Army Corps of Engineers
Department of Energy
Environmental Protection Agency
Federal Energy Regulatory Commission
U.S. Department of Agriculture
  Forest Service
  Soil Conservation Service
U.S. Department of the Interior
  Bureau of Indian Affairs
  Bureau of Mines
  Bureau of Reclamation
  Fish and Wildlife Service
  Geological Survey
  National Park Service
  Office of Surface Mining

Utah State Agencies

Clearinghouse
Department of Community and Economic Development
Department of Transportation
Department of Natural Resources and Energy
Division of Environmental Health
Division of Lands
Division of Oil, Gas, and Mining
Division of State History
Division of Water Resources
Division of Wildlife Resources
Geological and Mineral Survey
Office of the State Planning Coordinator

Local Government Agencies

Carbon County Commission
Duchesne County Commissioners
Garfield County Commission
Roosevelt Chamber of Commerce
Six County Economic Development District
Six County Organization of Governments
Southeastern Association of Governments
Uinta Basin Association of Governments
Uintah County Commissioners
Utah County Commission
Wasatch County Commission
Wayne County Commission

Nongovernment Agencies

American Fisheries Society
Archaeological Society of Utah
Council on Utah Resources
Defenders of the Outdoor Heritage
Friends of the Earth
ISSUE
National Parks and Conservation Association
National Woolgrowers Association
Natural Resources Defense Council
Rocky Mountain Oil and Gas Association
Sierra Club
SOURCE
Utah Audubon Society
Utah Cattlemen's Association
Utah Geological Association
Utah Mining Association
Utah Nature Study Association
Utah Water Resources Council
Utah Wildlife Federation
Ute Indian Tribe
Wild and Scenic Rivers
Wilderness Society
WHOA!

EIS Availability

Copies of this *Final* EIS will be available for public inspection at the BLM offices listed below:

Washington Office of Public Affairs
18th and C Street, N.W.
Washington, D.C. 20240
Phone: (202) 343-4151

Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111
Phone: (801) 524-4227

Richfield District Office
150 East 900 North
Richfield, Utah 84701
Phone: (801) 896-8221

Moab District Office
125 West 200 South
Moab, Utah 84532
Phone: (801) 259-6111

Cedar City District Office
1579 North Main
Cedar City, Utah 84720
Phone: (801) 586-2401

Vernal District Office
170 South 500 East
Vernal, Utah 84078
Phone: (801) 789-1362

Copies of this *Final* EIS may also be requested from the Utah State Office and the Richfield District Office at the above-listed addresses.

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CONSULTATION AND COORDINATION

COORDINATION, CONSULTATION AND REVIEW OF THE DRAFT EIS

The Utah Combined Hydrocarbon Leasing Regional Draft Environmental Impact Statement (EIS) was filed with the Environmental Protection Agency (EPA) and made available to the public on November 14, 1983. The EIS's availability and notice of the three hearings held to provide the public the opportunity to comment on the Draft EIS were announced by the U.S. Department of Interior (USDI) in the *Federal Register* on November 14, 1983. News releases were issued to alert local residents about the public hearings and the comment period for the Draft EIS. January 18, 1984 was established as the deadline for submission of written comments. The list of agencies, organizations, and individuals who received the Draft EIS and were invited to comment is included on Page iv of this Final EIS.

The public hearings were held in Price on December 5, 1983, in Vernal on December 6, and in Salt Lake City on December 7. Copies of hearing transcripts from the public meetings, along with attendance lists, are available for public review at the Richfield District Office, 150 East 900 North, Richfield, Utah.

All written comments and oral testimony from the public hearings were reviewed for consideration in the preparation of this Final EIS. Those comments that presented new data, questioned facts and/or analyses, and raised questions or issues bearing directly on the Draft EIS were responded to. Testimonies or letters which were general were reviewed but no responses were made. Letters 1, 3, 4, 5, 6, 10, and 16 did not require a detailed response. Comments which were recieved too late for inclusion in this Final EIS will be given consideration during the decision-making process.

There is a 30-day period to comment on this Final EIS. Those interested should send their comments to:

Roland G. Robison, Utah State Director
Bureau of Land Management
Utah State Office, University Club Bldg.
136 East South Temple
Salt Lake City, Utah 84111

A formal *Record of Decision* stating the selected alternative for Volumes II and III will be issued following the 30-day comment period. It should be noted that decisions on leasing within Special Tar Sand Areas (STSAs) will not be based solely on data presented in this Regional EIS.

GENERAL RESPONSES ON THE DRAFT EIS

Because of the large number of questions and misunderstandings on certain portions of the Draft EIS, a general response section has been added to this Final EIS. General responses are listed below.

General Response 1

Why are the surface disturbance figures and impacts inconsistent between the Utah Combined Hydrocarbon Leasing Regional Draft EIS and the Sunnyside Combined Hydrocarbon Lease Conversion Draft EIS?

The analyses presented in the Utah Combined Hydrocarbon Leasing Regional Draft EIS (hereafter referred to as the Regional EIS) and Sunnyside Combined Hydrocarbon Lease Conversion Draft EIS (hereafter referred to as the Sunnyside EIS) are not as inconsistent as they first appear. Apparent inconsistencies in disturbance and impacts between the two EISs result from different objectives, assumptions, and areas of analyses.

The Regional EIS is not based on specific mine plans: entire STSAs are analyzed. The Sunnyside EIS analyzes specific mine plans on only a portion of the Sunnyside STSA. Because the Regional EIS could address only potential levels of production, the time frame for the analyses is limited to a 20-year production period (up to the year 2005). A full and steady level of production could be reached by that time. Only the disturbance and impacts projected for the 20-year period are accounted for. The Sunnyside EIS is based on specific plans of operations, and the disturbance and impacts of up to a 95-year development life are addressed. Therefore, the two analyses cannot be directly compared because they analyze different total acreages over a different time frame with different proposals for development.

Apparent differences in the reported impacts are also a result of analysis assumptions that are clearly stated in the two documents. Volume I, page 93 of the Regional Draft EIS establishes a definition of disturbance as "only acreage where vegetation would be removed and soil was either leveled or moved. It does not include acreage where vegetation would be trampled." The Sunnyside Draft EIS (page 1-23) indicates that disturbance would range from open pit mining with vegetation removal to travel ways with crushed vegetation. The analyses based on these assumptions are not inconsistent because the degree of soil movement, vegetation loss, etc., was considered according to the type of disturbance projected (i.e., crushed vegetation or top soil disturbance). Both EISs assumed near maximum disturbance of the mineable areas for surface mining as indicated on Volume I, page 93 of the Regional Draft EIS and page 1-23 of the Sunnyside Draft EIS. They are also consistent in the estimate of disturbance for in-situ

operations, as the Regional Draft EIS indicates that surface disturbance from in-situ development would require 40 percent of each lease tract (Volume I, page 93) and the Sunnyside Draft EIS (page 1-39) assumes that, of the 100-percent surface disturbance by the Sabine in-situ process, 40 percent would be directly disturbed and 60 percent indirectly disturbed by worker and off-road vehicle (ORV) travel.

General Response 2

Why wasn't the analysis in the Regional EIS completed at a more detailed, site-specific level?

The following levels of analysis are required before tracts can be leased.

- Programmatic:
  reviews regulations, policies, and programs.
- Regional:
  reviews all like activities in the geographic area.
- Site Specific:
  reviews all tracts in a particular lease sale.
- Mine Plan:
  reviews detailed development under Federal lease.

The purpose of this EIS is to provide only general and cumulative data and analysis on a regional basis; Volume I is not intended to be site-specific. Environmental Assessments (EAs) or EISs will be prepared for each plan of operations submitted for development on a particular lease tract; these documents will include site-specific data and analysis.

To reduce duplication and paperwork (as called for in the National Environmental Policy Act [NEPA]), "tiering" has been used during the preparation of documents for the Combined Hydrocarbon Leasing Program. Through tiering, general information presented in one document will not be repeated in subsequent documents; this information will only be referenced.

The tiering strategy for the Combined Hydrocarbon Leasing Program is shown below.

Tier	Lease Conversion	Competitive Sale
Programmatic	EA on Conversion Regulations	EA on Competitive Leasing Regulations
Regional	Regional EIS (cumulative impacts of conversions)	Regional EIS (cumulative impacts of leasing)
Site Specific	Plan of Operations Review Planning Amendments Review (Volume II)	Regional EIS (impacts of tracts delineated for lease sale (Volume III) Planning Amendments (Volume II)
Mine Plan	Plan of Operations Review	Plan of Operations Review

The Regional EIS contains the following two tiers:

Tier	Product
Regional	Effects of potential tar sand leasing (both conversion and competitive) on eastern Utah (Volume I).
Site Specific	Areas acceptable for future leasing Delineated tracts for lease sale (Volume III)
	Effects of land use planning amendments for leasing categories (Volume II)

Both of these tiers will require some review of lease conversions. The Regional EIS required a review of the proposed lease conversion applications to arrive at a cumulative analysis of alternative levels of combined hydrocarbon leasing. The site-specific EAs or EISs will review converted combined hydrocarbon leases (CHLs), where required, to determine the impact of leasing specific tracts at specific production levels.

General Response 3

How are Combined Hydrocarbon Leases obtained?

Federal tar sand leasing and lease conversions are authorized by the Combined Hydrocarbon Leasing Act of 1981. Prior to passage of the Combined Hydrocarbon Leasing Act, oil and gas leaseholders could not develop tar sand within their leases.

COMBINED HYDROCARBON LEASE CONVERSIONS

The Combined Hydrocarbon Leasing Act redefined the term "oil" to allow for development of both oil and gas and tar sand under a single lease. It also created a new type of lease (CHL) allowable only in certain STSAs in Utah. The Act provided for conversion of existing oil and gas leases within these STSAs to new CHLs. In addition, it allowed unleased areas in STSAs to be offered as competitive lease sales.

Under a CHL, the leaseholder is entitled to develop all hydrocarbon resources except coal, oil shale, and gilsonite. Leaseholders holding valid oil and gas leases within designated STSAs were allowed to convert their leases to CHLs if they submitted a plan of operations by November 16, 1983, and if that plan was determined by BLM to qualify under criteria of diligent development of the tar sand resource and reasonable protection of the environment. Reasonable protection of the environment must be documented by an EA or EIS. If the existing oil and gas leases are converted, new leases will be issued for a primary term of 10 years. On such leases, tar sand may be developed according to an approved plan of operations (which can be amended), and oil and gas can be developed if found on the

lease. If existing oil and gas leases in STSAs are not converted, they remain as valid oil and gas leases until the original lease term has elapsed.

The 11 STSAs in Utah are presently the only such areas in the United States designated by the Combined Hydrocarbon Leasing Act for conversion to CHLs. The lease conversion provision of the Act represents a one-time-only opportunity for leaseholders to noncompetitively obtain CHLs. As unconverted oil and gas leases in STSAs expire, the land will become available for competitive combined hydrocarbon leasing by the public.

COMBINED HYDROCARBON COMPETITIVE LEASE SALES

All lands not leased for oil and gas within STSAs are potentially available for competitive CHL sales. The process for offering these sales includes the following steps:

1. The Bureau of Land Management (BLM) announces that Expressions of Interest for CHLs will be received until a certain time.
2. After Expressions of Interest are received, BLM decides which areas should be made into potential lease tracts.
3. Potential lease tracts are analyzed in an EA or EIS, as was done in Volume III of this Final EIS.
4. BLM then determines which tracts to offer for lease and announces the competitive sale.
5. After the sale, the highest bidders of each tract will be given a lease with stipulations.
6. Prior to developing the lease, the leaseholder will be given time to prepare plans of operations, including proposed mitigation. The plan of operations will then be examined for NEPA compliance.

ORAL TESTIMONY AND LETTER RESPONSES

An index of substantive oral comments and letters received on the Draft EIS is listed below. After this list are copies of substantive oral comments made at the public hearing and all comment letters received. Responses to the comments appear after the respective oral testimony or comment letter. A telephone call from the Office of Surface Mining, Washington, D.C. Office, stated that that office had no comments on the Draft EIS.

Oral Testimony From the Public Hearing

Commentor	Comment No.
Roy Gunnell, Utah Division of Environmental Health Bureau of Water Pollution Control	1
Rod Millar, Utah Energy Office	2-4
Terri Martin, National Park and Conservation Association	5-6
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Comment Letters

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USDI, Bureau of Mines	1
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Comment 1: Roy Gunnell

"Salinity control must be a prime concern. Much effort, money, and time for studies and implementation of salinity control projects has occurred by various agencies for salinity control programs."

Response: Impacts to the Colorado River from increased salinity levels is a major issue. Potential salinity impacts from a tar sand industry were analyzed by using the Colorado River Simulation System model. See Volume I, Chapters 3 and 4, Water Requirements and Effects on Colorado River System section and Volume I, Appendix 3. Also, refer to both Letter Comment and Response 28.1 for a discussion on potential water sources that could decrease salinity levels in the Colorado River.

Comment 2: Rod Millar

"A couple of things: One is I notice in the EIS, the Draft EIS, that you're using data in your project alternatives from the Enercor project. And we know that they've gone out of business; they've gone bankrupt; and their project at P.R. Springs is no longer a viable project. And I'm just wondering does that affect at all the kind of assumptions that you've made relative to the kind of project they were proposing? There have been some questions about the viability of the kind of proposal that they were making."

Response: Enercor still holds a viable existing lease in the P.R. Spring STSA; this lease could be converted to a CHL. A plan of operations and an application to convert to a CHL have been submitted by Enercor.

Comment 3: Rod Millar

"And the Utah Geological Mineral Survey has done some field surveys in tar sand areas, in particular the San Rafael Swell; and their analysis indicates that the resource that's present--and I can only speak in general terms because there might be some specific differences here--but generally they feel that the resource is of such low saturation that it really is not an economically viable resource to extract.

"And in that--There are other estimates, for instance, in the Tar Sand Triangle, that revise the original estimates of twelve and a half to sixteen billion barrels down considerably, down to maybe four or five billion as it might be more realistic."

Response: The bitumen saturation of the tar sand in the San Rafael Swell STSA may be as low as 3 gallons/ton (Tripp, 1984). If this is the case, this STSA would not be as favorable as some of the other STSAs for development. The purpose of the EIS is not, however, to determine which STSAs contain economically extractable tar sand deposits, but to develop a leasing scenario to provide for development at some future date.

A paper by the Utah Geological and Mineral Survey is in progress which discusses and revises some of the early estimates of the actual content of bitumen in place in the Tar Sand Triangle (Tripp 1984). As indicated in a description of the tar sand resource (Volume 1, Chapter 2), the estimates of the amount of bitumen present cited in the Draft EIS may be inaccurate by a factor of 10 (USDI, Minerals Management Service [MMS], 1982).

Comment 4: Rod Millar

"And lastly I'd like to discuss the alternatives that were presented in the EIS. Now, in terms of some of the data presented, for instance, on air quality, where it appears that there are going to be Class I and Class II Air Quality violations at both the high- and low-production scenario, I was wondering why there wasn't another alternative examined in the EIS and didn't assume both conversion of existing leases and new leasing. In other words, it seems just that perhaps there could be another alternative which would allow for conversion of existing leases with, perhaps, no new leasing, at least in some areas. And it just seemed to us that the alternatives were too broad to address all the issues that are being presented in the EIS itself."

Response: The alternatives were developed to satisfy the NEPA requirements on a regional level and to analyze the cumulative effect of the entire program. In reading Volume 1, Summary, one finds that production at the high commercial level would violate air quality standards. However, as explained in Volume 1, Chapter 4, those violations would only occur in certain areas. Companies could set lower production goals and propose mitigation to lower impacts in those areas.

It should be noted that the competitive lease sale has not yet been held.

Comment 5: Terri Martin

"First of all, speaking of alternatives, it bothered me to see that both of the alternatives listed here included three areas which are of special concern to the National Parks and Conservation Association. And those are: the Tar Sand Triangle, Circle Cliffs, and the San Rafael Swell. We consider these areas of particular environmental sensitivity because they're either in a National Park unit, immediately adjacent to, or overlie one or more wilderness study areas."

Response: Portions of the Tar Sand Triangle do fall within the Glen Canyon National Recreation Area (NRA). A plan of operations has been submitted and a site-specific EIS (USDI, National Park Service [NPS], 1984) is currently being prepared for part of the Tar Sand Triangle. Plans of operations and site-specific EISs must also be written for developments in the Circle Cliffs and San Rafael Swell STSAs prior to commencement of any operations.

Preparation of an EIS does not preclude impacts that may not be compatable with National Park or wilderness values; however, this document does disclose environmental impacts to the public. The law which created Glen Canyon NRA allowed for mineral exploration and development. The Management Plan for that area (USDI, NPS, 1977) also addresses mineral development.

Comment 6: Terri Martin

"Is it mandatory according to the Combined Hydrocarbon Leasing Act that conversion applications be converted to combined hydrocarbon leases?"

Response: The Act says that the lessee or claimant is entitled to a conversion based upon a plan that demonstrates reasonable protection of the environment and diligent development of the tar sand. The EIS is the document which will be used to assess reasonable protection of the environment. The law provides no discretion to BLM as to where the conversions should or should not be allowed (selective leasing) provided that the two tests mentioned above are met. Also, refer to General Response 3.

Comment 7: William Lockhart

"And my question would be: Is it possible that an acceptable plan of operations which assures reasonable protection of the environment and diligent development would be a plan which proposes continued research for an extended period of time permitting the conversion of the lease under a plan of operations which simply does as much as the technology permits and doesn't compel further action beyond the scope of existing technology?"

Response: BLM has attempted to balance the intent of Congress on this provision with the reality of the state of the industry. BLM recognizes that a developer could not provide details on all aspects of a tar sand proposal during the period that Congress has provided and that the technology is still evolving. However, it also recognizes that the intent of Congress is to receive a commitment from the applicants to develop the lease, not simply to perform additional research. The review process attempts to balance these two realities by focusing on those activities that can realistically be expected to occur and to deal in a conceptual mode with those activities that will be modified as new information is received or new technology is developed. This does not relieve BLM of ensuring that reasonable protection of the environment is provided throughout the project life; rather, it extends that responsibility beyond the plan as an application to the implementation and modification of that plan.

Comment 8: William Lockhart

"What standards are controlling the determination of an acceptable plan filed within 2 years. And: Is there any legitimate basis for permitting a continuing process of heefing up of unacceptable plans till they become acceptable? What limitations will be imposed upon heefing up those plans. And to the extent that heefing up of those plans is a continuing attempt to improve upon the technology, why shouldn't companies be compelled to resort to the competitive leasing program where they cannot provide at the time of their original filing either an assurance of reasonable protection of the environment or diligent development of the resource?"

Response: Much confusion exists concerning what the Combined Hydrocarbon Leasing Act of 1981 actually requires to comply with the conversion provisions. Section 8 of that Act refers to various sentences to an application, a complete plan of operations, a proposed plan of operations, and an acceptable plan of operations. To answer particularly the first three parts of the issue, a description of the review process may be helpful.

The first milestone in the Act requires an application within 2 years of the date of the Act. The regulations explain that the application is required to include "a plan of operations which shall meet the requirements of 30 CFR 231.10 (h) and (c) and which shall provide for reasonable protection of the environment and diligent development of the resource requiring enhanced recovery methods of development or mining (43 CFR 3140.2-3)." Projects proposed under this plan were expected to vary substantially from major surface mining or in-situ operations to small road-base or drilling projects. To accommodate these variations, the regulations rely heavily on the determination of the BLM officials in the field as to what should be required in a specific instance.

Once the applicant meets the filing deadline, BLM official(s) will examine the plan and determine what additional data it needs for a proper review. The applicant then has 60 days to provide that data. Failure to provide the additional data within the 60 days will result in rejection of the application. It is quite possible that the review may generate additional questions from the BLM official(s). This process does not involve the question of the acceptability of a plan nor of "heefing up" the plan. It is simply a process to ensure that the information that the reviewing official(s) needs for a particular application is made available.

The second milestone in the Act directs the Secretary of Interior to suspend the running of the term of any oil and gas leases proposed for conversions upon the submission of a "complete plan of operations." The requirement for a complete plan, therefore, is not associated with the filing deadline, but with running of the term of the oil and gas lease.

The third milestone in the Act requires that "the Secretary shall act upon a proposed plan of operations within 15 months of its submittal" (emphasis added). The implementing regulations were unclear as to what constituted a proposed plan of operations and, therefore, at what point the 15-month deadline would start. In a memorandum dated March 23, 1983, the drafters of the regulations explained that the intent of the regulations was to define a proposed plan of operations the same as a complete plan of operations. The rationale for that conclusion was that, since the purpose of the 15-month deadline was to ensure that BLM reached a determination on these applications in a timely manner, it would be unreasonable to expect that the review would be based upon an incomplete plan.

The final milestone in the Act bases a lease conversion upon an acceptable plan of operations. An acceptable plan of operations must meet the intent of the Act and the implementing regulations. The plan must demonstrate reasonable protection of the environment and diligent development of the tar sand. In reaching this determination, BLM official(s) must keep in mind that the intent of Congress was to encourage the development of Federal tar sand and that the conversion of the lease he given in return for a commitment to develop the lease. If that commitment can he ascertained and the proposed method of development provides reasonable protection of the environment, the plan must be deemed acceptable even if modifications to the plan are required at a future date. BLM does not have the option, in that instance, to lease the lands through the competitive program.

Comment Letter 1

United States Department of the Interior

BUREAU OF MINES

P. O. BOX 25086
BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

Intermountain Field Operations Center

December 7, 1983

Your reference:
1793 (U-933)

Memorandum

To: State Director, Bureau of Land Management, Utah State Office, University Club Building, 136 East South Temple, Salt Lake City, Utah 84111

From: Chief, Intermountain Field Operations Center

Subject: Review of the Utah Combined Hydrocarbon Regional draft environmental impact statement (EIS), Carbon, Duchesne, Emery, Garfield, Grand, San Juan, Uintah, and Wayne Counties, Utah (3 Vol.)

Personnel of the Bureau of Mines have reviewed the subject document to determine whether mineral resources and mining operations are adequately considered. The draft EIS identifies the known mineral occurrences and mining operations in or near all 11 Special Tar Sand Areas (STSAs), which are the areas of primary concern in the subject document. Potential impacts on these other mineral deposits and mining operations are adequately discussed in the draft EIS. The Bureau of Mines has no objection to the subject document as written.

Donald P. Blasko

Donald P. Blasko

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Comment Letter 2

Santa Fe Energy Company

Executive Office
Suite 1000
1616 South Voss Road
Houston, Texas 77057-2698
713/783-2401
TWX 910 881-1019

December 8, 1983
CERTIFIED MAIL

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

RE: Utah Combined Hydrocarbon Regional
Draft Environmental Impact Statement

Dear Sir:

As provided in the cover letter dated November 4, 1983 transmitting the captioned draft EIS to the public, Santa Fe Energy Company hereby submits its comments.

As reflected in the comments, our main concerns include unrealistic Tar Sand Triangle tar recovery project size and number, and unsubstantiated environmental impact conclusions, particularly regarding air quality.

Before a final Statement is released, Santa Fe Energy Company requests that they be given a reasonable opportunity to respond to BLM's responses to our initial comments, and appropriately factored into the final EIS.

Sincerely,

Larry D. Killion
Director Government Affairs

/mk

CONSULTATION AND COORDINATION

Comment Letter 2

UTAH COMBINED HYDROCARBON REGIONAL DRAFT EIS
COMMENTS FROM SANTA FE ENERGY COMPANY

VOLUME 1: REGIONAL ANALYSES

2.1 Page 1. The discussion in the summary section regarding alternative energy resources indicated that conservation and other energy resources would wholly replace tar development. This is highly misleading in that tar sand development activity would continue on a relative scale influenced by other factors such as economic and technical advancements in other energy categories. The comment that energy conservation can account for 5 million barrels of oil per day is highly suspect since this represents approximately 40% of the total present consumption. The basis of this conservation number needs to be explained. The comment that the electric utility industry could switch from oil to coal has already taken place to a substantial degree. Since one of Santa Fe Energy's sister subsidiaries is The Atchison, Topeka, and Santa Fe Railroad Company, they are unclear as to the comment that rail transport travel efficiency could be improved since this has been an on-going task for the company for over a century. The comment regarding the replacement of gasohol as an alternative fuel source needs to be fully explained since this is a very economically sensitive energy alternative. In addition significant secondary impacts would occur, such as the need of technological adjustment in motor vehicles.

2.2 Page 2. The discussion on mitigating measures regarding the inclusion of Category 1 or Category 2 stipulation in combined hydrocarbon leases needs to be expanded. In particular, many land use planners are confused that a converted hydrocarbon lease automatically gives a lessee full rights to disturb the land to accomplish tar sand development. Obviously, this is an incorrect assumption since each stage of tar sand development land disturbance must undergo its own individual site specific evaluation and mitigation impact review. Consequently, a mere conversion of a combined hydrocarbon lease does not give automatic rights to lease development.

2.3 The Alternative Two low commercial production construction and operation work force appear to be high when compared to the high commercial production Alternative One case. Since there is a fourfold decrease in tar sand production between the alternatives, there is not even a reduction in half of the construction and operation personnel.

2.4 Page 6. The Figure Two regional population projection by alternative illustrates that the no action alternative will result in an increase in baseline population of 32% and 46% in the years 1995 and 2005, respectively. The Alternative One and Alternative Two tar sand development cases would add anywhere from 7% - 30% increase in population above baseline projections. It would appear these increases in tar sand population would not be that significant since the Alternative Two case is considered to be a very aggressive based case.

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2.5 Page 8. The comment that social consequences would be compared to energy related "boom towns" is a highly subjective comment and should be eliminated from the DEIS.

2.6 Page 10. Objection is made to the comment that tar sand development could not occur in Wilderness Study Areas because "development measures could not meet nonimpairment standards". A nonimpairment determination can only be made after site specific lease development activities are defined. The incorrect quotation is paramount to saying that absolutely no development could occur in a Wilderness Study Area where existing leases occur.

2.7 Page 14. The question is raised regarding the energy efficiency calculations. In particular, a comment was made that certain infrastructure energy was used as a component of net energy inputs. This is highly suspect since such energy needs are actually a targeted market into which net energy outputs are allocated. The inclusion of infra-structure energy needs would appear then to inaccurately bias the energy efficiency calculation such that it would read too high.

2.8 Page 15. Reference is made that Appendix 1 presents the assumptions and data used in developing the two production alternatives. Reference is made to the Tar Sand Triangle comment since Santa Fe Energy Company has provided a Plan of Operations addressing tar sand recovery in this resource area. Reference is made to the 30,000 BBL in-situ operation. Santa Fe submitted this production rate in its base case Plan of Operations since it was believed to represent the most conservative assumption and "worse-case" impact expected. Consequently, environmental impacts associated with this production rate are expected to be "worse-case". Actual production rate will be dependent on a number of variables yet to be defined as outlined in the Plan of Operations. Extent of tar sand resource, economic, technological advances, and other yet to be provided data including pilot plant evaluations will effect the ultimate production rate. Santa Fe Energy Company is unaware of any other interested party

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2.6 cont. that would have a comparable sized tar sand operation. Therefore the inclusion of another 30,000 BBL in-situ operation is highly suspect. Further the assumption of an inclusion of a 10,000 BBL surface project is also highly suspect since the geographic and topographic conditions of the Tar Sand Triangle Area all but precludes surface mining development. As a minimum this 10,000 BBL base case should be eliminated from the evaluation. As for the low commercial figure, Santa Fe Energy Company recommends that a single 5,000 BBL in-situ operation be considered. The likelihood of two 10,000 BBL in-situ operations is highly suspect since Santa Fe is very much involved in current known interested parties wishing to develop the Tar Sand Triangle Area. It is possible that other interested parties may join Santa Fe or others in a joint venture operation thus eliminating the possibility of multiple development cases. As is also discussed in the Appendix, water consumption and availability are yet to be fully defined awaiting exploratory and other tar sand resource preliminary evaluation activities. The comment that a five barrel of water used per one barrel of bitumen

2.9 produced basis would be considered a high range estimate. Santa Fe Energy's own experience in other heavy oil related oil activities has indicated that as low as two barrels of water used per one barrel of oil produced may be a range factor that should be used in the water requirement analysis. Further, the Appendix 1 work force

2.10 analysis for in-situ construction and operation personnel ratios appears to lie in the ball park of estimated personnel, previously estimated by Santa Fe Energy for its Tar Sand Triangle Project. However, consideration must be given that these are only estimates and the DEIS preparers may wish to include a range of work force personnel in their analyses. The Page 15 comment that industry officials have not suggested that the figures in Appendix 1 do not lie within the realm of future possibility is taken somewhat out of context. As many as the Plan of Operations illustrate, exploratory activities are required to accurately define where tar sand development will take place and to what extent. Until these exploratory operations are completed almost any guess at operating figures could lie within the "realm of future possibility". Therefore to assign a conclusion by industry that any one operating level is possible is highly inaccurate at this stage of the decision making process.

2.11 Page 21. The comment that in-situ operation usually result in the surface disturbance in 30% - 60% of the area involved is highly variable and in fact could be substantially less than 30%. For instance, Canadian experience with the clustering of wells where an isolated area is used in which a centralized incation of wells are directionally drilled radially would result in a reduction in land disturbance. For instance, some estimates indicate that far every 10 acres of land disturbed 160 acres would be developed or a surface disturbance of 6%.

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2.12 Page 22. Table 2-2 indicates a wide variability in estimated water requirements. The degree of water reuse and recycle would significantly impact these water requirements. Santa Fe Energy Company has had extensive experience regarding water recycle and steam flooding operations in their Kern County, California steam flood heavy oil recovery projects. Our initial observation is that the in-situ water requirements in general appear high. The same comment would apply on Page 24 for Table 2-3.

2.13 Page 30-31. The summary of environmental consequences illustrated in Table 4 should be footnoted with a caveat that these are only generalized conceptions. In particular, specific comments made regarding air quality PSD violations, water resource utilization, soils impact, topographic disturbance, vegetation removal, are at best broad general categorizations and can not be defined until site specific projects are evaluated in detail. Furthermore, mitigation activities would substantially effect these environmental consequences and in many cases reduce, if not eliminate, the impact.

2.14 Page 37. The comment on water requirements that all available water would be used by the year 2040 should be substantiated by calculation or reference to the bibliographical resource.

Page 71. It is interesting to note that the socio-economic evaluation conducted by Argonne National Laboratories indicated that traditionally most of the region for tar sand development has been dependent on agricultural or energy development and residents are well acquainted with the cyclical nature of energy related growth.

2.15 Page 93. Analysis and assumption guideline Number 3 indicated that surface disturbance from in-situ development would require 40% of each lease tract for drill pads, pipelines, and roads. The basis for this land disturbance is considered to be highly variable at this point until site specific design criteria established. For instance, as earlier discussed, should a cluster type directionally drilled well arrangement be specified then conceivably less than 10% of each lease tract would be disturbed. Consequently, the discussion on surface disturbance should be presented as a range and not a specific surface disturbance analytical evaluation.

2.16 Item 5 under analyses, assumptions and guidelines indicated that 70% of the bitumen would not be recovered as a worse case situation for in-situ development. The basis for potential recovery of bitumen is a highly variable parameter, dependent upon geological constraints and tar sand reservoir characteristics. Until exploratory and pilot plant operations are conducted and even then possibly commercial production the percent recovery of bitumen in general is unknown at this time. These same comments apply to Item 7 in the assumptions category.

2.17 Page 94. The Item 13 discussion on transportation analysis where the assumption and guideline category indicates primarily truck conveyance of produced tar. The transportation modes for many tar sand projects are unknown at this time. For instance, on site production of electrical power from tar production could be an alternate in lieu of transferring tar product to refinery. Further, the potential exists for the installation of pipelines where bitumen is upgraded to a syncrude and conveyed by conventional means. In summary, other modes of transportation should not be totally ruled out at this time but at least mentioned as alternatives at least in the long term.

2.18 Page 94. The lease stipulation regarding a Section 7 jeopardy biologic opinion regarding an off-site species should include a sentence that reads as follows "The plan must cover species occurring on-site as well as those off-site species which may reasonably be adversely impacted".

2.19 Page 102. Reference was made that an air quality impact assessment was performed by Aerocomp, Inc., (1983). Their methodology is discussed in Appendix 5. Aerocomp's evaluation indicated violations of certain air quality criteria. A review of Appendix 5 indicated insufficient information on which to prepare comments to express our concerns regarding the air quality impact analysis. In particular, insufficient air emission information is available to do an air quality impact analysis that would designate the violations of air quality standards. Further, Appendix 5 made reference to the use of various screening types of air dispersion models and use of non-EPA sanctioned air quality computer models. Both of these air quality bases by design would result in very conservative air quality results that without site specific information or utilization of calibrated models, violations of air quality criteria would be expected though inaccurate model and model bases . Consequently the entire air quality section should either be eliminated or at the very least a broad and general discussion made of the generalizations used in the air quality analysis as well as its conservatism and inaccuracies. In addition, no mention is made of the type

2.19 cont. of air pollution control equipment used on source emissions. In certain mitigating cases air pollution control equipment would reduce emissions to levels that would result in dispersion modeling predicting total compliance with air quality criteria. Again, none of these technical details were discussed in Appendix 5.

Prior to distribution of a final environmental impact statement a detailed discussion of all data and procedures used by Aerocomp's air quality analysis is requested to be distributed to the public for comment.

2.20 Page 104. Table 4-4 indicates for the Dirty Devil River depletion in year 2005 to be 8,579a and 11,079a acre-feet. These depletions are considered to be highly suspect or else explanation in the Table is inadequate. For instance, in the year 1995 depletion of 1,679a acre-feet is presented for a tar sand production rate of 30,000 BPD. This production rate based on our best estimate would not increase. Consequently the depletion of water should not escalate at the rate at which it is presented in Table 4-4.

2.15 cont. Page 109. Again the comment that in-situ extraction would disturb 40% of the acreage on which tar is removed is considered to be a highly suspect number at this time. As previously discussed, land disturbance could be less than a factor of 10%.

2.21 Page 110. Comments regarding revegetation and reclamation of disturbed lands should be tempered with lease stipulation requirements regarding reclamation studies and test plots. For example, in Santa Fe's Tar Sand Triangle Plan of Operations we anticipate providing for test plots in which various vegetations are cultivated and a reclamation program thoroughly defined well before commercial operations would begin. These type of activities would have a significant mitigating impact on vegetation considerations.

2.22 Page 114. A comment under the visual resources category indicated that in most VRM Class III and all Class II areas, a permanent degradation of scenic values would be expected from in-situ development. No justification or analytical evaluation information is given to substantiate this conclusion. Substantiation of this conclusion is required for completeness of the environmental impact evaluation.

Page 116. It is interesting to note that the most significant change in population in the region, with respect to tar sand development, would occur in Carbon County. The balance of the counties over a twenty year time period indicates little to moderate growth in population.

2.23 Page 123. The comment under transportation that existing refineries are not able to process bitumen is partially incorrect. For instance, in some cases bitumen could be blended with other like crude oils and the blend processed in existing operations. Upgrading and processing technologies for bitumen presently exist in the form of such operations as coking, hydrotreating and hydrocracking.

2.19 Page 139. Comments regarding air quality for Alternative One in the Tar Sand Triangle SUSA were previously covered in the Appendix 5 discussion.

Page 143. Summary of air quality impacts in Table 4-14 for Alternative Two indicates potential violations of air quality criteria as a consequence of the Tar Sand Triangle tar development project. Comments made regarding air quality analysis in Appendix 5 also apply to this Table.

2.20 Page 149. The water depletion for Alternative Two and Table 4-17 with regard to the Dirty Devil River appears to be high. Comments previously given for Page 104 and Table 4-4 are appropriate for Table 4-17.

2.8 Page 174. Again the Alternative Two assumption of 20,000 BPD from in-situ development appears to be high. As previously discussed a more appropriate alternative range would be in the 5,000 BPD or as a maximum 10,000 BPD operations.

2.24 Page 176. The regional overview on air quality indicates a listing of companies proposing development within the region. A statistical or probability biasing factor needs to be factored into the Alternative Three air quality impact cases for these projects to take into account the likelihood that they will not be developed. For instance, one list of projects cites Tesco as a potential developer. It is our understanding that the likelihood of this project going forward is unlikely. Probably other projects lie in this low probability category. The ultimate cumulative impact of these projects could significantly effect the overall impacts associated

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2.24 cont. with Alternative One and Two, particularly if any one of these projects are not developed. A sensitivity analysis needs to be conducted to provide the necessary information to account for the cumulative impact uncertainties.

Page 180. It is significant to note that population projections even in Alternative Three show an ever increase in growth in the region with or without tar sand development.

2.1 Volume 1, Summary, Alternative Energy Sources section states: "Other energy sources could influence the need for tar sand development," not wholly replace it. As stated in the comment, tar sand development would continue on a relative scale, influenced by economic and technical advancements in other energy categories.

The energy conservation estimate of 5 million barrels of oil per day is based on modeling done by the Solar Energy Research Institute (1981). The figure can be tabulated as follows.

Residential Sectors	Potential Savings
Cost effective new home design	265,000 BLD[a]
Uninsulated pre-1976 homes	335,000 BLD
Partially insulated pre-1976 homes	315,000 BLD
1976-1980 era fuel heat homes	22,000 BLD
Oil burner retrofit	189,000 BLD
Utility investment in energy conservation	937,000 BLD
Commercial Sector	
Newly constructed commercial buildings	25,000 BLD
Existing commercial buildings	304,000 BLD
Industrial Sector	
Cogeneration	680,000 BLD
Boiler efficiency improvement	1,000,000 BLD
"Oil Blackout" conservation legislation	
Phases 1 and 2	1,000,000
Total	5,072,000 BLD

[a]Barrels per day.

The comment that rail transport could be improved refers to the savings in energy that could be realized by shifting from truck transport to rail transport. Trucks haul less than one-fifth of all freight and use one-half of all fuel. Finally, the EIS states that gasohol could reduce dependence on oil, not replace it.

2.2 A full discussion regarding categorical and special stipulations for tar sand development can be found in Volume 1, Appendix 2, pages 212-214 of the Draft EIS. Specific reference to surface disturbance stipulations for CHAs can be found in Volume I, page 213 of the Draft EIS. In addition, a discussion of mitigating measures can be found in Volume I, Summary and Chapter 2.

2.3 There is only a partial correlation between the level of production and the size of the project work force. Certain facilities are required regardless of the level of production (i.e., plant production facilities, access roads, drilling rigs, well pads, etc.). Refer to Volume 1, Appendix 1, Work Force section for an example.

2.4 It is true that baseline growth will result in a considerable increase. Under each alternative, population-induced impacts from tar sand development would be significantly greater in some areas than others.

2.5 The energy-related impacts causing "boom towns" have been well documented by western states. One of the better known studies is mentioned in the EIS: "The Sociological Analysis of Boom Towns" (Cortese and Jones, 1977). An example of a tar sand related boom town would be Hanksville, where newcomers would outnumber native residents by 1993 under the high and low production scenarios, thereby causing major stresses to the community infrastructure and cultural and social structures.

2.6 Any development in a Wilderness Study Area (WSA) must meet nonimpairment standards. Appendix A of the Interim Management Policy (IMP) for Lands Under Wilderness Review (USDI, BLM, 1979b) defines nonimpairing as follows:

> "(a) It is temporary. This means that the use or activity may continue until the time when it must be terminated to meet the reclamation requirements of paragraphs (b) and (c) below...
>
> "(b) Any temporary impacts caused by the activity must, at a minimum, be capable of being reclaimed to a condition being substantially unnoticeable in the wilderness study area (or inventory unit) as a whole by the time the Secretary of the Interior is scheduled to send his recommendations on that area to the President and the operator will be required to reclaim the impacts to that standard by that date...Reclamation will include the complete recontouring of all cuts and fills to blend with the natural topography, the replacement of topsoil, and the restoration of plant cover at least to the point where natural succession is occurring...The reclamation schedule will be based on conservative assumptions with regard to growing conditions, so as to insure that the reclamation will be complete, and the impacts substantially unnoticeable in the area as a whole by the time the Secretary is scheduled to send his recommendations to the President.
>
> "(c) When the activity is terminated, and after any needed reclamation is complete, the area's wilderness values must not have been degraded so far, compared with the area's values for other purposes, so to significantly constrain the Secretary's recommendation with respect to the area's suitability or nonsuitability for preservation as wilderness..."

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Appendix F of that document also defines "substantially unnoticeable" as follows:

"Refers to something that either is so insignificant as to be only a very minor feature of the overall area or is not distinctly recognizable by the average visitor as being manmade or man caused because of age, weathering, or biological change...."

Thus, any tar sand development within a WSA would have to be "temporary," completed, and the area reclaimed to a "substantially unnoticeable" condition prior to May 1986. Any development would also require definition of site-specific lease development activities and appropriate environmental review to ensure that nonimpairment standards were met. Those actions would also probably require several months.

Therefore, considering the time constraint and rehabilitation requirements, there is little or no potential for development of tar sand resources within WSAs where existing oil and gas leases occur. Certain activities associated with tar sand development (i.e., surface mining and construction of facilities) would not meet IMP standards.

2.7 Infrastructure energy is used as part of the standard energy analysis; it allows comparison of different projects on equal terms. Energy consumption from increased population in the area would be transferred, not created. Therefore, local energy needs would increase as people relocated even though national needs could stay the same. A chart showing energy efficiency has been added to Volume 1, Chapter 1, Energy Efficiency section of this Final EIS.

2.8 Based on oil and gas leases eligible for conversion and plans of operations submitted by Santa Fe/Altex et al. and other companies (Norton Pepper, Maurice Brown, Sohio, and Kirkwood Oil), a 70,000-barrel per day (BLD) production in the Tar Sand Triangle STSA was projected and analyzed for high commercial production (Alternative 1) and two 10,000-BLD operations were estimated for low commercial production (Alternative 2). Consideriog the plans of operatioos submitted by industry and the estimated resource available, these projections are oot unreasonable for impact analysis projections. The total BLD production from all conversion applications is about 328,000. Your suggested alternatives have beeo coosidered and are within the range of alternatives already discussed in this Final EIS.

2.9 A range of 2 to 10 barrels of water are required to extract 1 barrel of bitumen according to Keefer and McQuivey (1979) as quoted in Potential Hydrologic Impacts of a Tar Sand Industry in 11 Special Tar Sand Areas in Eastern Utah (USDI, Geological Survey [GS], 1983). Actual data were used when submitted by companies; otherwise, the water requirements were calculated as discussed in Volume 1, Appendix 1, Part E, Water Requirements section. This mid-range estimate was used realizing that actual water use would vary according to recovery method and possible recycling of some water.

2.10 The levels of production, upon which the work force analysis was based, were supplied hy industry and other sources as the best estimates available at the time. Other socioeconomic factors relative to work force numbers were consequently projected using the Utah Process Economic and Demographic Impact Model and the Spatial Allocation Model. It is recognized, however, that exploratory activities by industry would probably revise these work force numbers, and these would he evaluated again prior to on-the-ground development.

2.11 A review of comments received from industry has indicated that surface disturbance could, indeed, be as low as 10 percent and as high as 60 percent. According to Dr. James Weher (1983), approximately 40 percent of the surface could he disturhed through in-situ operations. The BLM is of the opinion that, on a statewide basis, this figure is valid for the cumulative surface area contained in the STSAs. The actual acreage disturbed in a given STSA would depend upon the characteristics of the deposit and the topography. An approved plan of operations would identify the actual area disturbed, and an analysis would be made of the impacts, based on that plan.

2.12 Refer to Volume 1, Appendix 1 and Letter Response 2.9.

2.13 The summary table of unavoidable adverse impacts, irreversible/irretrievable commitments of resources, and the relationships of short-term use of the environment to maintenance and enhancement of long-term productivity was compiled from the unavoidable adverse impacts discussed for each resource in Chapter 4. Because of a lack of site-specific project data, general assumptions had to he made in the impact analysis. These assumptions/guidelines are stated in Volume 1, pages 93-94 of the Draft EIS.

A detailed analysis of site-specific projects would more accurately assess impacts. However, it is not the intent of the Regional EIS to provide site-specific data. It is true that additional mitigation measures could he proposed in plans of operations to reduce or eliminate environmental impacts.

2.14 Please refer to Volume 1, Appendix 3. This contains a list of water depletioos maintained hy the Bureau of Reclamation, Upper Colorado Region, Salt Lake City, Utah. A complete listing of the projected water supply and depletions in the Upper Colorado River Basin as of August 1982 is contained there.

2.15 Refer to Letter Response 2.11.

2.16 The comment indicates that this is a worst-case assumption for bitumen recovery efficiency by in-situ methods. Recovery efficiency would depend upon the geologic environment and recovery method used and could, in fact, he much higher. For the purposes of this EIS, however, the BLM estimates that, at the least, in-situ methods would yield 30 percent of the in-place bitumen on a regional hasis.

2.17 Other modes of transportation are, of course, possible and would be analyzed as part of additional environmental assessment prior to on-the-ground development. For analysis purposes in this EIS, it was assumed that existing transportation routes and refineries would be used. However, the text in Volume I, Chapter 4, Alternative 1 (Regional Overview), Transportation section has been expanded to address the use of pipelines.

2.18 The wording in the special provision to avoid a Section 7 jeopardy Biological Opinion was developed in consultation with the Fish and Wildlife Service (FWS). No changes in this provision will be made at this time. The FWS has submitted a comment letter (No. 6) which states its position.

2.19 Consultation and coordination were integral parts of the process. Region VIII of the Environmental Protection Agency (EPA), the National Park Service (NPS), the Utah Bureau of Air Quality, and the Ute Tribe, among others, were consulted throughout the analysis.

The nature of the analysis did not warrant the use of refined air quality models. Those used in this screening analysis are EPA-recognized, state-of-the-art screening models and procedures. VALLEY is a guideline model; RPM and MESOPUFF were developed under EPA sponsorship; they have been discussed in the literature and, of late, have been used frequently. The remaining procedures are state-of-the-art in air quality assessment work and have performed well, given the constraints of available data. Meteorological data sets are not plentiful in the region; those available and found applicable to the study were used after statistical screening. Emissions were based on industry's best estimate of production, emission factors from EPA Region VIII, the Department of Energy's (DOE's) Laramie Energy Technology Center, Lawrence Livermore National Laboratory, and other current sources. Control strategies that appear technically feasible and enforceable in a permit process were assumed and, hence, were factored into the modeling analysis.

Volume I, Appendix 5 was intended as a brief description of the analysis methodology. To obtain more information on the modeling approach or on any of the above topics, please refer to Aerocomp, Inc.'s (1984) air quality technical report.

2.20 The first number referred to (8,579) is for the year 2000 rather than 2005. Analysis was done in accordance with the proposal for Alternative 1 which assumed tar sand development in the Tar Sand Triangle STSA would increase progressively to 70,000 BLD, which could result in water depletions of 11,079 acre-feet/year by 2005. In Volume I, Table 4-4 of the Draft EIS, Footnote a was in error and has been corrected in this Final EIS. Acre-feet should be read directly as printed on the table.

Refer to Letter Responses 2.8 and 2.9 for a discussion on determination of water requirements for Alternatives 1 and 2.

2.21 Rehabilitation of disturbed land caused by surface or in-situ mining would have to be accomplished with the greatest care and with appropriate methods. Existing methodologies for revegetating barsh sites may be inadequate (McKell et. al, 1978). A well-designed

Response Letter 2

reclamation program with test plots would likely improve the chances of successfully revegetating disturbed sites.

2.22 In virtually every case, Visual Resource Management (VRM) Class II areas are characterized by Class A (outstanding) scenery. To qualify for a Class A scenic quality rating, the area must possess distinctive visual qualities. As indicated in Volume I, Chapter 3, in the STSAs this equates to high vertical relief (cliffs, spires, steep canyons, rock outcrops, etc.) with a variety of vegetation types and intense color combinations.

VRM Class III areas are characterized by Class A and B scenery. Class B scenery (above average/high quality) possesses many of the same characteristics.

By virtue of these characteristics, rehabilitation of Class II and most III areas subject to in-situ tar sand development (roads, pipelines, drill pads, and other facilities) to a state where all disturbed areas were unnoticeable from the natural condition would not be possible. The mixing of soil horizons, recontouring of cuts and fills on steep slopes (especially cuts through bare rock), and revegetation would, at a minimum, create long-term contrasts and inevitably, in some portions of the affected Class II areas, permanent contrasts (degradation) would be expected.

2.23 The text has been revised in Volume I, Chapter 4 of this Final EIS to read that some existing refineries may not be able to process bitumen.

2.24 A decision was made to include the applicants' projects considered in the Uintah Basin Synfuels Development Final EIS (USDI, BLM, 1983g) and interrelated projects as the baseline for the combined hydrocarbon leasing air quality analysis. It is possible or even likely that one or more of these projects may not be developed. Also, there could be other developments not yet proposed that would be built, possibly offsetting impacts assumed from any "interrelated projects" not being built.

Volume I, Tables 4-2 and 4-3 of this Final EIS show that some cumulative impacts are predicted. However, these data show that the estimated cumulative impacts are not especially significant.

Comment Letter 3

United States Department of the Interior

OFFICE OF THE SOLICITOR
INTERMOUNTAIN REGION
SUITE 6201, FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138-1180
December 14, 1983

BLM.IM.0060

Memorandum

To: State Director, Bureau of Land Management

From: Regional Solicitor, Intermountain Region

Subject: Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement

We have reviewed the Draft EIS and find it in compliance with the requirements of the National Environmental Policy Act of 1969, and the Counsel of Environmental Qualities Regulations.

REID W. NIELSON
Regional Solicitor

By James A. Limb
JAMES A. LIMB
Attorney

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Comment Letter 4

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO ATTENTION OF

December 16, 1983

Regulatory Section

Mr. Allen Partridge, EIS Team Leader
Richfield District Office
Bureau of Land Management
150 East 900 North
Richfield, Utah 84701

Dear Mr. Partridge:

We have no comments on the "Utah Combined Hydrocarbin Regional Draft EIS", at this time.

We will be interested in the site specific analyses when they become available. These analyses will assist us in determining whether particular actions will require a Department of Army permit under Section 404 of the Clean Water Act (33 USC 1344).

If you have any questions, please contact Mr. Jim Gibson of our staff at telephone (FTS) 448-2541.

Sincerely,

Art Champ
Chief, Regulatory Section

CONSULTATION AND COORDINATION

Comment Letter 5

United States Department of Agriculture — Forest Service — Manti-LaSal National Forest — 599 West Price River Drive Price, Utah 84501

Reply to: 2820

Date: December 16, 1983

State Director
Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Gentlemen:

We received a copy of the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement on November 14, 1983, and appreciate the opportunity to review and comment.

The Combined Hydrocarbon Leasing Program does not involve lands within or directly adjacent to the Manti-LaSal National Forest, therefore, the program should not directly affect lands that we administer. We have no other comments.

Sincerely,

for
REED C. CHRISTENSEN
Forest Supervisor

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Comment Letter 6

United States Department of the Interior
FISH AND WILDLIFE SERVICE
ENDANGERED SPECIES OFFICE
1406 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138-1197

IN REPLY REFER TO:

December 29, 1983

MEMORANDUM

TO: State Director, Utah
Bureau of Land Management, Salt Lake City, Utah

FROM: Field Supervisor, Endangered Species Office
U. S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Utah Combined Hydrocarbon Regional Draft EIS and potential affects on Federally listed threatned and Endangered species.

We have received and reviewed the "Utah Combined Hydrocarbon Regional Draft EIS" (DEIS). We strongly support your lease provision as follows and believe it will adequately address the conservation needs of threatened and endangered species which may be affected by tar sand development.

> "The lessee shall develop a plan of operation which will fully protect listed or proposed threatened or endangered species and shall submit the plan to BLM for formal consultation with FWS as required by Section 7 of the Endangered Species Act. The plan must cover species occurring on site as well as those off-site species which may be adversely impacted. Consultation must be completed prior to the irreversible or irretrievable commitment of resource or funds for on-the-ground development.
>
> "This lease is issued and accepted with the express agreement that such consultation may require adjustments to the plan of operation, additions of special conservation measures, or limitations to the project in order to assure compliance with such provisions of the Endangered Species Act as may be applicable as determined by FWS at the time of development."

The potential impacts we forsee to threatened and endangered species as a consequence tar sand development have been discussed in the DEIS. The following situations plus other unforseen situations; may provide the circumstance which will require consultation under section 7 of the Endangered Species Act.

1. Proposed change of water quality and water depletion from the Colorado and Green Rivers and their tributaries will have an affect on the Colorado squawfish and humpback chub.

2. Proposed surface disturbance to areas occupied by white-tailed prairie dog towns may have an affect on the black-footed ferret if they occupy those towns. An inventory utilizing the latest FWS approved black-footed ferret inventory techniques should be performed in each prairie dog town to be affected by tar sand development.

Comment Letter 6

3. Proposed surface distrubance to areas harboring or near peregrine falcon eyries or wintering bald eagle concentrations may have an affect on those species. An inventory utilizing adequate raptor inventory techniques should be performed in all areas of suitable habitat for peregrine falcons and bald eagles.

4. Proposed surface disturbance to areas occupied by populations of listed plant species including the Uinta Basin hookless cactus and Wrights fishhook cactus may have an affect on those species. A botanical inventory should be performed in all areas of suitable habitat for the Uinta Basin hookless cactus and Wrights fishhook cactus.

We encourage you to use your authorities in conserving all biological resources on lands discussed in your DEIS for tar sand leasing especially candidate species until such time as they become listed under the ESA.

Fred L. Bolwahnn

17

Comment Letter 7

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

In Reply Refer To:
EGS-Mail Stop 423

JAN 12 1984

Memorandum

To: State Director, Bureau of Land Management
Salt Lake City, Utah

From: Assistant Director for Engineering Geology

Subject: Review of Utah Combined Hydrocarbon regional draft environmental statement, Carbon, Duchesne, Grand, and Uintah Counties and vicinity, Utah

We have reviewed the draft statement as requested in your letter of November 4.

7.1 It is stated that mitigation of impacts on springs will be required (vol. II: p. 74 and app. I: p. 181). We suggest that mitigation should also be applied to impacts on wells.

for James F. Devine

CONSULTATION AND COORDINATION

Response Letter 7

7.1 It is assumed that existing Federal and State regulations would be followed. This would result in a thorough program of water monitoring before, during, and after mining and development of effective reclamation procedures (Uintex Corporation, 1981). Also, refer to Volume II, Appendix 1, Public Water Reserve 107 and Legal Water Source Stipulations section. This applies to protection of wells, springs, aquifers, and streams.

Comment Letter 8

1792
(U-933)

WHOA!

WILD HORSE ORGANIZED ASSISTANCE INC.
A Foundation for the Welfare of Wild Free Roaming Horses and Burros

P. O. Box 555
Reno, Nevada 89504
Telephone 329-5908
Area Code 702

BOARD OF TRUSTEES
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In Memoriam
LOUISE C. HARRISON
VELMA B. JOHNSTON, "Wild Horse Annie"

Kathryn A. Cushman
Box 26
Canterbury, New Hampshire 03224
January 9, 1984

Roland G. Robinson, State Director
BLM Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr. Robinson:

Thank you for the opportunity to comment on the three Combined Hydrocarbon Regional Draft Environmental Impact Statement.

I find it extremely difficult to believe that the Secretary of the Interior or Congress would be willing to allow this deliberate, permanent destruction of over one million acres of land, scenic areas and land very near some national parkland; incredible air pollution (thousands of tons per year of five different pollutants listed in V I, Chapter 4), as well as particulate emissions; soil erosion; pollution of groundwater; destruction of riparian habitat (3 miles in just one area); permanent destruction of aquifers in an area where water is a precious commodity; increased water demand by mining operations; complete loss of a wild horse herd; loss of 500 acres of wild burro range in just one area; irreversible elimination of natural scenic areas; disruption and eradication of much wildlife habitat now inhabited by endangered species; loss of livestock grazing land and negative effects to Utah communities required to absorb the influx of people associated with tar sand development.

By BLM's admission, much data on the tar sand deposits "are sparse" and "based on estimates" (V I, Draft EIS, p. 15). Also "...there is much uncertainty concerning the level of production that can be expected" (V I, p. 21, Draft EIS, Description of Alternatives).

One could list page after page of the negative effects of this abominable proposal. Table 2-2 (V III, p. 19-20, Draft EIS) attempts to present the losses, tables in V II also summarize environmental effects. Any intelligent, unbiased individual reading through the Utah Combined Hydrocarbon Regional Draft EIS cannot arrive at any conclusion but acceptance of the No Action alternative.

8.1 A blatant omission in the Draft EIS is that nowhere in the three

CONSULTATION AND COORDINATION

Comment Letter 8

Utah Combined Hydrocarbon Regional Draft EIS, page 2

8.1 cont. volumes is an accurate cost analysis regarding the feasibility of extracting oil from tar sand, costs which would be passed on to the consumer. The only benefits of this proposal would be reaped by the large oil companies who hopefully will not even have the opportunity to bid on this poorly researched (by industry) project.

BLM is to be commended for presenting the negative, irreversible effects objectively. The price, environmentally and economically, is just not worth it, particularly for a project that will terminate in 20 years. Please accept the No action alternative.

Sincerely,

Kathryn M. Cushman

Kathryn M. Cushman (Mrs.)
representative, WHOA

copies to: Secretary of the Interior
U.S. Senators Warren Rudman
Gordon Humphrey
U.S. Representatives Judd Gregg
Norman D'Amours
Dawn Hoggin, Director WHOA

Response Letter 8

8.1 Economic uncertainties about future costs of producing oil from tar sand preclude accurate cost recovery analysis at this time. Tar sand development on a commercial scale in the United States is not presently a well-defined technology. It is known that large capital outlays would be required for a commercial scale operation. The current availability of conventional oil and gas and the anticipated future price of world oil affects technological development for tar sand. Also, refer to Volume 1, Chapter 2, Alternative Energy Sources section in this Final EIS.

Comment Letter 9

Mr. Roland G. Robison, State Director
Bureau of Land Management
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr. Robison,

I would like to comment on the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement.

Since the DEIS is divided into three volumes, my comments are arranged accordingly. But first, there is a serious discrepancy in Volume III. Please see my comments for that section.

9.1 Volume I:
I don't really understand the purpose of Volume I. It doesn't give a preferred alternative, doesn't thoroughly evaluate anything, doesn't state how the BLM plans to deal with the impacts of Tar Sands development, and doesn't seem to have any reason to be part of the DEIS other than to have a place to put a lot of meaningless numbers.

9.2 Volume II:
San Rafael Swell SYSA
A totally absurd analysis and preferred alternative. This section is so poorly done that it should be rewritten to give some real alternatives. The Preferred Alternative should use Alternative 4 as a start with much more acreage included in Catagory 2 and Catagory 3 to protect visual resources and recreation. Areas that are presently WSAs obviously have special characteristics that should be protected even if they aren't included in the Wilderness System. All of the WSA acreage should be in Catagory 3. No map showing VRM classifications is presented in the analysis. The 5% of the SYSA that is in VRM Class II should be placed in Catagory 3. The 15% of the SYSA that is in VRM Class III should be placed in Catagory 2. Overall, the Alternatives are a joke. Even Alternative 4 doesn't place adequate restrictions on leasing to preserve true Multiple Use.

Sunnyside and Vicinity SYSA (Southern)
This section of the DEIS is a great improvement over the previous section (San Rafael Swell SYSA). There actually is a range of alternatives given and reasonable restrictions are proposed to protect the other resources in the SYSA. The preferred alternative

Comment Letter 9

should be Alternative 4. The Nine Mile Canyon Archaeological District (#119) should be placed in Catagory 3. This area is too unique and important to be destroyed by Tar Sands development or any other kind of development. The Sunnyside Water Supply Reserve (#110) should be placed in Catagory 3. The Range Creek Watershed (#116) should be placed in Catagory 3.

9.3 White Canyon SYSA
This section has an inadequate analysis. No information regarding VRM classes is presented. VRM Classl and VRM ClassII should be placed in Catagory 3. VRM Class III areas should be placed in Catagory 2.

Circle Cliffs SYSA
The preferred alternative should be Alternative 4: Restricted Development (Resource Protection). Land adjacent to Capitol Reef National Park should be placed in Catagory 3. VRM Class III areas should be in Catagory 2. The Canyons of the Escalante CMA should be placed in Catagory 3. WSAs, although not shown on the maps, should be placed in Catagory 3 since they obviously have outstanding VRM qualities and high recreational values.

Asphalt Ridge/White Rocks SYSA
The preferred alternative should be Alternative 4 to protect the area with outstanding cultural resources. If significant cultural resources are found in other parts of the SYSA, special restrictions should be on development in those areas.

Pariette SYSA
Alternative 3 (BLM Preferred Alternative) should adequately protect the other resource values of the area.

Argyle Canyon/Willow Creek SYSA
Alternative 3 should be the preferred alternative since the other resource values will be too greatly affected by either in-situ or surface mining of Tar Sands.

Sunnyside SYSA (Northern Portion)
Alternative 3 should be the preferred alternative. All of the Nine Mile Canyon Archaeological District should be placed in Catagory 3 to protect the Cultural Resources in thim unique and important area. All VRM Class II areas should be placed in Catagory 3.

9.4 Volume III:
The BLM Preferred Alternative, #4, is a reasonable alternative; however, there is a major discrepancy. Tract 1, in the preferred alternative,(#4), is placed in Catagory 1. In Volume II, pp 71,72, (BLM Preferred Alternative #3), Tract 1 is placed in Catagory 2. Alternative 4 in Volume III should be changed to conform with the Preferred Alternative #3 in Volume II.

Sincerely,

Owen Severance
P.O. Box 1015
Monticello, Utah
84535

CONSULTATION AND COORDINATION

Letter Response 9

9.1 This EIS is divided into three volumes to more clearly identify the major Federal actions being analyzed. Volume I provides an overview and cumulative impact analysis of potential tar sand development in Utah resulting from enactment of the Combined Hydrocarbon Leasing Act. This volume serves as the regional analysis on which to tier Volumes II and III which consider land use plan (Management Framework Plan [MFP]) leasing category amendments and proposed leasing of potential lease tracts, respectively. Volume I will also be used for tiering other environmental documents such as conversion EAs or EISs. However, it should be kept in mind that Volume I is for analyzing the overall impacts of the Combined Hydrocarbon Leasing Program and will not be used for establishing any particular target or production levels. Congress has not authorized BLM to establish production goals, but has written the Combined Hydrocarbon Leasing Act to encourage involved companies to begin production where environmentally compatible. Volume I does not have a preferred alternative because it was not the intent of BLM to establish production levels for energy companies.

9.2 The alternatives analyzed present different approaches to the BLM objective of making lands and resources available for combined hydrocarbon leasing while adequately protecting other multiple resource values (e.g., visual, recreational, and cultural). In those cases where particularly scenic areas (VRM Class II) were left in category 1, it was believed that either (1) the potential tar sand values outweighed scenic values; or (2) the standard category 1 leasing stipulations (refer to Volume II, Appendix 1) would provide adequate protections.

In each case, prior to conducting exploration or development activities, a leaseholder would have to submit a plan of operations. That plan would undergo a site-specific environmental review to ensure that there were safeguards and mitigation measures to minimize adverse impacts to other resources. Federal lands would also receive an archaeological survey before surface-disturbing activities were permitted.

As the analysis shows in Volume II, Chapter 2, some highly scenic areas could be irreparably damaged under both Alternatives 3 and 4. A map showing the VRM classes has been added to the analysis of the San Rafael Swell STSA, Volume II, Chapter 2 of this Final EIS.

9.3 The discussion of visual resources has been expanded in Volume II, Chapter 2 of this Final EIS to include information regarding VRM classes. Your opinion will be considered in the decision-making process.

9.4 The text has been changed in this Final EIS to correct this error. Volume II is correct and Volume III, Chapter 4, reflects the correction.

Comment Letter 10

P. O. Box 584
Zephyr, Texas 76890
January 10, 1984

State Director
Bureau of Land Management
Utah State Office
University Club Bldg.
136 East South Temple
Salt Lake City, Utah 84111

Dear Sir:

The Bureau of Land Management should adopt Alternative 3, NO ACTION, as described in Volume I of the Utah Combined Hydrocarbon Regional Draft EIS for the Sunnyside Special Tar Sand Area. Under this alternative only oil and gas leases would be allowed on the Sunnyside STSA. No conversions to combined hydrocarbon leases would be approved and no new Federal leases would be issued. The Chevron tar sand project on private land would be unaffected.

Please note that I am not advocating the No Action alternative for all the STSAs. The Sunnyside STSA is such an outstanding primitive area that it would be a sacrilege to destroy it with strip mining. Rather than opening the Sunnyside STSA to tar sand mining of any kind, the BLM should strive to obtain Wilderness designation for the Desolation Canyon area. We have other sources of energy but we have only one primitive area containing the unique characteristics of Sunnyside.

Sincerely,

Joan B. Schindler

Joan B. Schindler

Comment Letter 11

2900 South Clebe Road, #508
Arlington, Virginia 22206
11 January 1984

State Director, Bureau of Land Management
Utah State Office
University Club Building, 136 East South Temple
Salt Lake City, Utah 84111

Sir:

Your Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement shows that commercial tar sand development has unacceptable costs to lands in your charge. You should be denying conversions rather than offering new leases.

11.1 You have produced a bulky and unclear report. I do not find that volumes 2 and 3 really add much to the analysis in volume 1. The alternatives in volumes 2 and 3 are confusingly different from the alternatives in volume 1. In volume 3 the "no action" alternative means "no sale of new leases for 1984," but "no action" in volume 2 means "retain current leasing categorization of the SSTAs." (Most of the land in the SSTAs is currently in category 1.) "No action" in volume 1 means "no conversion of leases and no sale of leases." Similarly the Pariette SSTA is

11.2 not one of the developed areas in volume 1, but it is on all new lease lists in volume 3. The incorrect Emery-Carbon boundary on Summary Figure 1 (volumes 1 and 3) and Figure 1-1 (volume 2) does not inspire confidence in the rest of your report.

11.3 Appendix 3 of volume 1 ignores the greenhouse effect. Precipitation in the Colorado River drainage is predicted to decrease. Tar sand exploitation adds to the demand for water by direct use in processing and by increasing the local population. Tar sand processing adds carbon dioxide to the atmosphere. Use of the oil produced from the tar will add more.

11.4 The I-70 scenic corridor in the San Rafael Swell SSTA is currently in category 4, and most of the volume 2 alternatives retain protection for the corridor. I am happy to see a large area of a SSTA zoned to exclude tar sand exploitation. I am outraged, however, to see that the defacement of an area with an interstate highway seems to be necessary before protection from tar sand development is considered. Why are the many other equally beautiful and more nearly pristine areas of the Swell not receiving the same consideration? Why are White Canyon, Circle Cliffs and the Tar Sands Triangle not given the same respect as a roadside? Not only do these three deserve protection on their own, but for their adjacent National Monument and National Parks.

11.5 Although these projects, assuming they actually come on stream and do not expire from unprofitability leaving a mess with no one to clean it up, would last a considerable time, they must end by their very nature. Where is the consideration of the resulting Ciscos and Uravans in your report? Even during the life of a project its supporting one-industry town would be subject to hard times when energy production was depressed.

The beauty of the SSTAs is an irreplaceable part of our national heritage. It must not be sacrificed to tar sand exploitation.

Sincerely,

Thomas J. Messenger

Thomas J. Messenger

Letter Response 11

11.1 Volume I presents an analysis of regional impacts resulting from implementation of different development levels. The alternatives discussed in Volume I reflect those levels. Volume II contains proposals for amending leasing categories for the STSAs in the Moab, Cedar City, and Vernal districts in the form of four alternatives. Volume III is a site-specific analysis of leasing on 18 potential lease tracts within the STSAs. The alternatives here apply only to those tracts.

In all three volumes, the No Action Alternative reflects the current situation or management according to the land use plans currently in effect for a given area. In Volume I, oil and gas development is currently allowed on existing leases and would continue under the No Action Alternative. No Action in Volume II assumes development in accordance with the existing land use plans, which outline the current leasing categorization. Management actions not included in those plans would not be authorized. No Action in Volume III also assumes development compatible with the existing land use plans. Leasing not provided for in those plans would not be allowed. The wording changes from volume to volume in the No Action Alternative are necessary to describe the existing situations.

The three Pariette lease tracts are included in the site-specific assessment in Volume III; however, impacts are not included in the analysis in Volume I because their potential for tar sand development is expected to be low.

11.2 The northeastern Carbon-Emery boundary lines have been amended on Summary Figure 1 (Volumes I and III) and Figure 1-1 (Volume II) in this Final EIS.

11.3 Volume I, Appendix 3 addresses projected water supplies and depletions in the Upper Colorado River Basin. For air quality related discussions, refer to the Air Quality sections in this EIS. The greenhouse effect is the absorption and reradiation of terrestrial energy by atmospheric water vapor, carbon dioxide, and ozone. The types of pollutants from tar sand production, including carbon dioxide, would probably contribute to a small, but unquantifiable, multiregional greenhouse effect. The major concern of the greenhouse effect is the possible atmospheric disruption of the earth-atmosphere radiation balance; however, atmospheric science has not been able to quantify regional air pollutant sources into effects upon global air temperatures (Moran, Morgan, Wiersma, 1973).

11.4 Refer to Letter Response 9.2.

11.5 Volume I, page 71 of this Draft EIS acknowledges that most of the project area has been acquainted with the "boom and bust" cyclical nature of energy-related growth. This Statewide EIS is limited to a regional overview focused on a county level; however, the socioeconomic impact analysis (Volume I, pages 116-124 and pages 156-163 of the Draft EIS) substantiates the concerns stated in the comment.

Comment Letter 12

Wasatch Mountain Club
3155 Highland Drive
Salt Lake City, Utah 84106

13 January 1984

State Director, Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr Robison:

Concerning the Draft Environmental Impact Statement for the Utah Combined Hydrocarbon Leasing Program:

12.1 The Wasatch Mountain Club appreciates the opportunity to submit its concerns on the Utah Combined Hydrocarbons Leasing Program, and to express its support for the Bureau of Land Management Preferred Alternative (#4) of leasing seven tracts under multiple use, subject to BLM categories 2 and 3. Those other tracts are located at Pariette and Sunnyside. It is our understanding that the Sun Rafael, Tar Sands Triangle, Circle Cliffs, White Canyon and Book Cliffs tar sands areas will not be leased under this alternative. These latter regions are highly scenic and unique regions of the Colorado Plateau. By not leasing these areas for speculative tar sands industry, much of the controversy will be avoided.

In view of the fact that even the best resource planning is bypassed by political decision makers with special legislation and political pressures (i.e., the White River Dam and Reservoir Tar oil shale development), we would urge that the Bureau of Land Management designate the San Rafael, Tar Sands Triangle, Circle Cliffs, White Canyon, and Book Cliffs as no-surface occupancy and no additional road construction for for future leasing at this time. We have seen much political encouragement in synfuels developments where sound resource analysis and decisions based on these analysis are by-passed with pork barrel legislation and Federal and State subsidies for uneconomical projects which the free-enterprise system refuses to invest their own monies.

12.2 The Wasatch Mountain Club suggests several additions to the General Policy Guidelines:

1) All employees of the developers of the leased lands will not be permitted to have fire arms in possession while on duty. Duty begins when employees are on the leased lands. This stipulation was instituted by the U.S. Forest Service with the Smith-Morehouse Reservoir Project and has proved and is widely utilized in Wyoming and Idaho. The purpose of this stipulation is to discourage poaching of wildlife by employees either on the job or in traveling to and from the job as well as to discourage firearm vandalism (shooting of signs).

2) All new roads must be clearly marked as well as clear markers be maintained for the old roads. Recreationists in the oil shale region and in some of the uranium regions follow roads and end at a guard station with no trespassing. New roads hide the junctions of the existing roads and lead recreationists far off their course and away from their destiny.

3) Multiple-use in leased lands needs further clarification. In the oil shale region much of the leased lands is off limits because of the guard stationed at the roads. We applaud such actions to keep off-road vehicles out of leased lands and thus control unnecessary soil erosion in impacted areas. However, hikers and outdoor enthusiasts are likewise excluded from such lands as well as legitimate hunting and fishing activities.

12.3 The Wasatch Mountain Club would like further clarification of leasing the Pariette unit. During the oil shale hearings and the White River Dam hearings, the Pariette was in part BLM's answer to the loss of unique river riparian habitat by designation of the Pariette Draw as a Watershed Management area. Now we feel that both the White River-with no protection granted to its unique riparian habitat and the Pariette Draw riparian habitats are threatened by speculative synfuels development.

Sincerely,

Peter Morleph, President

CONSULTATION AND COORDINATION

Response Letter 12

12.1 The only tracts that would be offered for competitive leasing under the preferred alternative are located in the Sunnyside and Vicinity and Pariette STSAs. However, the selection of an alternative to be implemented has yet to be made, and this selection may or may not be Alternative 4.

12.2 The type of guidelines suggested in the comment would be addressed at the site-specific level following the submission of plans of operations by developers and as a result of specific on-the-ground needs. In addition, companies may put such guidelines in their plans of operations as proposed mitigation.

12.3 The area identified in the Oil Shale and White River Dam hearings as the Pariette Waterfowl Management Area is protected in Volume II, Alternatives 3 and 4. Refer to Special Watershed stipulation in Alternative 3 (Volume II, page 143) of the Draft EIS) and to Watershed category 3 in Alternative 4 (Volume II, page 147 of the Draft EIS) in the Pariette STSA section. Prior to commencement of any tar sand development, a plan of operations would have to be developed and, where appropriate, a site-specific EA or EIS written. The site-specific document would present mitigation and analyze impacts that would occur within the "tailor-made" mitigating measures applied. In this way, impacts to the waterfowl management area could be specifically identified and mitigated.

Comment Letter 13

INDIAN ROCK ART RESEARCH

Tribune Correspondent
Portrait Photography

Owned and Operated by
N. LAYNE and KAREN MILLER

P.O. Box 515 - Price, Utah 84501
Telephone (801) 637-7152

Mr. Roland G. Robison, State Director
Bureau of Land Management
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr. Robison,

I am writing to comment on the Utah Combined Hydrocarbon Regional Draft EIS. I believe each of the areas are large enough and sensitive enough that each of the areas should have had their own EIS written but since they didn't, I will comment on each section separately.

Volume I

13.1 Volume I is a sort of enigma. Why was it there? It doesn't really evaluate anything or even give a preferred alternative.

Volume II - San Rafael Swell & Alt

13.2 The analysis and preferred alternative ruschen here totally ignore the visual, cultural and recreational resources for the San Rafael Swell. Writing as one who has spent alot of time in the Swell, I am appalled that Alternative 4 was not selected and that more acreage was not included in catagories 2 and 3.

more

INDIAN ROCK ART RESEARCH

Tribune Correspondent
Portrait Photography

Owned and Operated by
N. LAYNE and KAREN MILLER

P.O. Box 515 - Price, Utah 84501
Telephone (801) 637-7152

13.2 cont.

This whole area is spock marked with WSA acreage. All of them should be included in catagory 3. Why isn't there a map with VRM classifications shown? I would recommend that the 5% of the SITSA that is in VRM class II be included in catagory 3 and the 15% of the SITSA that is in Class III be included in catagory II.

There should be more protection of visual resource, recreational resources and the cultural resources in the DEIS. Even Alternative 4 doesn't provide for adequate restrictions. This is a delicate, fragile area. We must protect it!

Sunnyside and Vicinity SITSA (southern)

This section seems to have received more thought and careful consideration than the other sections. The preferred alternative should be Alternative 4. The Nine Mile Archaeological district should be put in catagory 3. I am very familiar with Nine Mile and the rock art and other cultural resources in the area. It has probably the highest concentration of rock art of any area in the state and possibly the west. It must be protected!

The Sunnyside and Range Creek watersheds should be protected so I recomment putting them in catagory 3.

INDIAN ROCK ART RESEARCH

Tribune Correspondent
Portrait Photography

Owned and Operated by
N. LAYNE and KAREN MILLER

P.O. Box 515 - Price, Utah 84501
Telephone (801) 637-7152

White Canyon

Yet, another beautiful, unique spot with a totally inadequate analysis. VRM class I and II should both be in catagory 3 and VRM Class III should be in Catagory 2.

Circle Cliffs

Alternative 4 should be selected here to protect the outstanding resources. All land adjacent to Capital Reef National Park should be in Catagory 3. Again the VRM Class III areas deserve to be in Catagory 2.

Another area of concern here is the canyons of the Escalante WSA. They should all be in Catagory 3. along with the WSA's in the area.

Volume III

13.3 Here alternative 4 is the preferred one but there is a discrepancy that should be corrected. Tract 1 in the prefferred alternative #4, is in catagory 1. In Volume II, preferred alternative 3, it is in Catagory 2. Volume III should be changed so Tract 1 is catagory 2.

Thankyou for the opportunity to reply.

Sincerely,

N. Layne Miller
P.O. Box 515
Price, Utah 84501

We Record and Reproduce Indian Writings, One of America's Natural Resources

Response Letter 13

13.1 Refer to Letter Response 9.1.

13.2 Refer to Letter Response 9.2.

13.3 The text in this Final EIS has been changed to correct this error. Volume II is correct and Volume III, Chapter 4, reflects the correction.

Comment Letter 14

STATE OF UTAH
OFFICE OF THE GOVERNOR
SALT LAKE CITY
84114

SCOTT M. MATHESON
GOVERNOR

January 17, 1984

Mr. Roland Robison
State Director
Bureau of Land Management
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Roland:

Enclosed are the state of Utah's comments on the Utah combined Hydrocarbon Leasing Regional Draft EIS (Volumes I, II, III). These comments, prepared by the Utah State Mineral Leasing Task Force, reflect deficiencies which should be addressed prior to the publication of the Final EIS. Beyond these specific comments, I wish to discuss what appears to be a fundamental problem with the program.

14.1 The Combined Hydrocarbon Leasing Act requires companies seeking conversions to have submitted a plan of operation to the BLM by November 15, 1983. Under the conversion regulations, a decision on a conversion application must be made within 15 months of receipt of a completed plan of operation. Additionally, new leasing of combined hydrocarbons in the Special Tar Sand Areas is scheduled for May 1984. Given the timing associated with the new leases and conversions, it appears that a great deal of federal land is going to become available for potential development within an extremely short time.

Of concern is the apparent lack of data sufficient to reasonably determine the nature and extent of impacts. The majority of conversion applicants do not have an appreciable knowledge of the quantity and quality of the tar sand resource in their respective tracts nor is there data available regarding impacts associated with commercial sized processing plants.

The state of Utah has been supportive of tar sand leasing and remains so. Nevertheless, I am concerned about the timing and extent of such leasing and the ability of the State to anticipate and mitigate potential development impacts. I am sensitive to the fact that in the development of any new resource there will be a certain amount of speculation and risk. To minimize those risks and to provide a process

Comment Letter 14

Mr. Roland Robinson
January 17, 1984
Page 2

in which development experiences can, in part, guide leasing level decisions, the BLM should reevaluate the direction the combined hyrdocarbon leasing program is taking.

I believe that two approaches should be considered which would allow the BLM to regain management control of federal tar sand activity. First, plans of operation should not be routinely approved. Only those plans of operation which reflect serious considerations for development should be approved. This is of particular importance given the unclear nature of diligence requirements in the Regulations.

The second approach that should be considered is a prototype lease. Previously, representatives of the state have suggested that the EIS should include a prototype alternative. I still believe this to be most practical and would allow for an orderly process in which resource and technological data can be gathered and utilized in subsequent analysis of leasing impacts.

I hope that consideration will be given to these comments and I look forward to the prudent leasing and development of this unique and valuable resource.

Sincerely,

Governor

SMM:tar
Enclosure

27

Comment Letter 14

SPECIFIC COMMENTS ON THE UTAH COMBINED HYDROCARBON

REGIONAL DRAFT EIS

UTAH GEOLOGICAL AND MINERAL SURVEY

14.2 The geologic aspects of the tar sand resources are not adequately defined in the DEIS. The DEIS should include:

1. A geologic map of the resources.
2. A grade-thickness map or some similar type of representation of the resources.
3. An overburden map and/or interburden map to give an indication of the amount of waste rock involved in a surface mine operation.

While only limited information is available with respect to almost all of the resource deposits, there appears to have been only a limited attempt to include the information that is available in the literature. For a document, an adequate definition of the resource is essential. Without it, the document and subsequent analysis will be highly conjectural and subject to challenge.

14.3 In those areas that the DEIS does attempt to give specific geologic information, there is usually some question as to the reliability of the data. For example:

1. Volume I, p. 15, "The estimates of the quantities of bitumen and the thickness of the bitumen are uncertain by as much as a factor of 10." This would indicate that a reserve figure of 500 million barrels of in-place bitumen may be in the range of 50 million to 5 billion barrels.

14.4 2. It is unlikely that economic exploitation of tar sands can be carried out by surface mining methods at some of the proposed depths: Volume III pp. 32-33, Tract 1 - 500 feet; Tract 3 - 400 feet; Tract 4 - 400 feet; Tract 8 - 700 feet, Tract 9 - 500 feet.

14.5 There is also no mention of the chemical composition of the resource or the enclosing rock. Metals and salts which are released from the tar, spent sand, and overburden could be significant when considering potential ground water and surface water contamination.

UTAH ENERGY OFFICE

'Purpose and Need' of Tar Sand Leasing Program

The leasing program established by the 'Combined Hydrocarbon Leasing Act of 1981' is viewed as removing historical impediments (technical categorizing of tar sands) to tar sand development. The program is seen as enhancing the process by which industry can plan for development of

CONSULTATION AND COORDINATION

the resource by insuring those developers have a clear and unencumbered claim to the in-place resource. It is the UED's position, however, that the leasing program as proposed contains serious inconsistencies which could, ironically, slow the rate of development.

14.6 The inconsistencies stem from language within the Act which requires detailed development plans to be submitted to the BLM by November 15, 1983. The BLM used these plans in deriving aggregate estimated impacts. The UED has canvassed eleven firms who report to have development plans for tar sand resources in Utah. Our findings indicate that development of tar sand in Utah is in only a conceptual stage, the sole exception being the preliminary work performed by the Chevron-Great National project. Regardless of BLM's disclaimer that they must accept plans submitted (at face value) (Sunnyside DEIS, pp. 1-45), the fact that all estimated impacts are based on a set of development plans which, by their nature, are highly uncertain implies that the estimated impacts are also uncertain. It is a simple fact that the impacts reported in the DEIS cannot be substantiated by referencing the concreteness of development plans. Such a high degree of uncertainty surrounding the validity of information contained in the DEIS would appear to leave the BLM (and thus, the leasing program) open to serious challenges (including legal challenges). The net result could be an acutal slowing of development of utah tar sands.

14.7 The basic problem of the leasing program, as proposed, stems from poor timing between the leasing program and the maturity achieved in research and development work on tar sand resources. The Act has forced industry to provide development plans when basic resource characterization has not been completed by most firms. The Act is viewed as being related to the Energy Security Act and, in that regard, enhancing the nation's domestic energy supply. However, the crisis environment which preceded the passage of the Energy Security Act has now subsided and decision-makers need not provide hastily created programs designed for quick implementation. The very fact that all tar sands projects face poor project economics is indicative of the more stable world energy market. The implication is that the sense of urgency contained in the DEIS to lease tar sand resources is not well founded and has contributed to the inconsistencies in the proposed leasing program.

Comments on Technologies and Alternatives

14.8 The draft EIS gives a generic overview of the primary tar sand development methods. This description, however, is of potential development methods due to the fact that no single method has been shown to be commercially viable at this time. Extensive research and development needs to be done in order to assess commercial viabilities. This research and development must begin with extensive resource characterization because the applicability of the development methods are dependent, to a large degree, on resource characteristics. Such characteristics are largely unknown in sufficient detail at this time. The uncertainties in resource characteristics and the specific application of technologies makes any environmental assessment speculative, at best, and cannot anticipate all likely impacts. Therefore, a phased approach which relies on detailed data accumulated at

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14.8 cont. each phase is suggested as a reasonable approach to tar sand development.

DIVISION OF ENVIRONMENTAL HEALTH

Air Quality

14.9 1. With regard to the high particulate concentrations caused by dirt roads, a mitigation plan needs to be analyzed. Since the areas near Price and Wellington show violations of the particulate NAAQS without the conversion of hydrocarbon leases, improvements in the secondary road system will be needed to handle increased traffic from the tar sands operations. The amount of mitigation needs to be analyzed with regards to the cumulative impacts on particulate concentrations near these cities.

14.10 2. It is obvious that there will be problems with the permitting of major tar sands facilities given the present state-of-the-art techniques for processing the tar sands. The large particulate concentrations associated with overburden removal will most likely prohibit the project from processing the amounts of tar sands proposed in the DEIS.

14.11 3. The DEIS should possibly analyze what the scale of production would be if all NAAQS are to be met. The fact that these projects cause new violations of the NAAQS is enough evidence that the given scenario of hydrocarbon lease conversion is NOT viable.

Water Pollution

14.12 Salinity control must remain a prime concern. Much effort, money and time for salinity control studies and implementation of salinity control projects have been undertaken by various agencies. All efforts should be made to insure that there not be any additional salts entering the Colorado River system either from construction activities or from the mining operations.

WILDLIFE RESOURCES

Volume I: Regional Analyses

14.13 Chapter 2 - Alternative and Tar Sand Resources

(page 22, Table 2.2) Significant numbers relating to water requirements and construction and operating work forces have been excluded from the totals because they occur on private land. The figures represent real and potential, significant impacts to the environment regardless of land ownership. Private ownership of the land will not nullify effects of increased population and water requirement impacts on the communities and environment. For these reasons, the figure cannot be left out of the analysis simply because the projects are on private land.

Alternative 1 -- High Commercial Production

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Chapter 3 - Affected Environment

14.14 Air Quality and Climate

(page 33, column II, paragraph 6) While all STSA's are in rural areas, the Sunnyside STSA is in the vicinity of two power plants which are major sources of air pollution.

14.15 Mule Deer

(page 53, column II, paragraph 4) Population estimates for Herd Unit 28A are inaccurate. Approximately 7,440 animals are present in 28A.

14.16 Eagle

(page 55, Table 3-12) The bald eagle has been documented as occurring within the P.R. Springs STSA and needs to be included in this table. There are four known active golden eagle nests in the Raven Ridge STSA, not one. This needs correction also.

14.17 Elk

(page 56, column I, paragraph 1) The population estimate of elk in the Book Cliffs herd is inaccurate. Approximately 1,035 animals are present.

14.18 Riparian Habitat

(page 56, column II, paragraph 2) The figure, 100 acres, is much too low. Sunnyside STSA itself estimates that 645 acres of riparian habitat would be impacted.

14.19 Aquatic Species

(page 57, Table 3-13) The right and left forks of Grassy Trail Creek are within the Sunnyside STSA. This portion of Grassy Trail Creek supports a brown trout fishery that would be impacted by development. Tabel 3-13 needs to make this clear.

14.20 Threatened, Endangered and Sensitive Aquatic Species

(page 58, column I, paragraph 4) In addition to the Colorado Squawfish and Humpback chub, the Bonytail chub, also an endangered species, exists in the Green and Colorado River systems. It needs inclusion in the discussion and in Table 3-14.

14.21 The DEIS has omitted discussion of reptiles, amphibians and nongame birds. Several of these species are of high interest to the State of Utah and sensitive in nature. Potential impacts to these animal groups need evaluation and discussion.

14.22 Public Safety: Law Enforcement

(page 83, 84) The discussion on law enforcement is incomplete without including a discussion of Division of Wildlife Resource's conservation

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14.22 cont. officer (C.O.s) in the affected areas and their work load. Approximately nine CO districts could experience a marked increase in fish and game violations and a corresponding need for additional law enforcement effort.

Chapter 4 - Environmental Consequences

14.23 Vegetation

(page 109, column II, paragraph 4) Sunnyside would disturb an estimated 36,000 acres. Table 4-6 estimates only 15,000 acres disturbed on the Sunnyside STSA. This contradicts figures given in the Sunnyside Draft Environmental Statement. Even subtracting the spent sand disposal areas of the STSA, 32,000 acres would still actually be disturbed, not 15,000.

14.24 Big Game

(page 111, column I, paragraph 1, 2, 3) The assumption that mule deer, elk and antelope are evenly distributed throughout their seasonal ranges is biologically unfounded and incorrect. Subtle biotic and abiotic factors make specific portions of their seasonal habitats more important than others, even though the entire range itself may appear fairly homogeneous in structure and composition.

14.25 The DEIS is not in a position to analyze losses of big game. Crucial data regarding the location and extent of fawning/calving grounds, migration routes and movements within both winter and summer range are lacking. Additionally, it is not known exactly where impacts will occur. Depending on site location of facilities and mines, impacts to wildlife could be far worse than indicated in the DEIS. For example: If the 11% summer range impacts, as predicted for the Sunnyside STSA, constitutes the entire fawning habitat for the herd, then deer losses would be significantly more severe than 11%.

14.26 The DEIS should point out that estimates of losses are not possible because of insufficient data. Furthermore, the losses presented here are the expected minimum and not a worse case scenario as required by NEPA. A strip mine of an appropriate magnitude in the appropriate location could nearly eliminate a herd. The DEIS should make this clear.

14.27 The estimates of animals lost under the Analysis of STSAs: Terrestrial Wildlife for each STSA are unfounded, and do not represent a worst case scenario for the reason cited above. The assumption of even distribution of wildlife, for analysis pruposes, is wrong and plays down the extent and magnitude of potential and real impacts.

Asphalt Ridge/Whiterocks STSA

14.28 Terrestrial Wildlife

(page 127, column I, paragraph 8) The extent of summer range has no bearing on the "no impact" analysis to big game since Whiterocks STSA would disturb important winter habitat, not summer range. Because Whiterocks STSA lies within winter range, impacts will be realized.

14.28 cont. Summer range is outside of the STSA, so, of course, impacts will not affect big game on this range.

P.R. Springs STSA

14.29 Terrestrial Wildlife

(page 132, column II, paragraph 5) Paragraph 5 states only 7% of the deer herd would be impacted, but on page 133, column I, paragraph 3, it points out that a tar sand development could reduce or eliminate wildlife populations. The assumption that wildlife populations are evenly distributed is invalid for impact analysis. This should be corrected in the DEIS.

Raven Ridge/Rim Rock STSA

14.30 Terrestrial Wildlife

Deer and antelope occur on this STSA. However, the importance of the area to these animals is unknown. Nonetheless, the DEIS should acknowledge this presence and the possibility of impact.

14.31 (page 134, column I, paragraph 8) The number of golden eagle nests (1) discussed here is incorrect. There are a least four active nests known on this STSA.

Sunnyside STSA

14.32 Vegetation

(page 137, column II, paragraph 5) The 15,000 acres of vegetation disturbed is incorrect. The Sunnyside Draft EIS estimates nearly 36,000 acres disturbed; almost twice the acreage discussed here.

14.33 Terrestrial Wildlife

The figures of disturbed summer and winter big game ranges discussed here do not agree with those in the Sunnyside DEIS. The Sunnyside DEIS estimates deer and elk summer range losses at 30,196 acres and 30,244 acres respectively as opposed to 7,500. Disturbance to winter range was 3,839 acres and 14,765 acres for deer and elk, respectively. Even substracting 4,000 acres of offsite spent sand disposal will not make up this difference.

14.34 Aquatic Species

(page 138, column II, paragraph 3) Reproductive and nursery habitats in Grassy Trail Creek could also be expected to be impacted. It should be discussed here as such.

14.35 Indirect impacts and their significance have not beem discussed, as required by NEPA. Indirect impacts are sometimes just as severe as direct ones. They would include:

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14.35 cont.

1. Loss of habitat to urban expansion to accomodate an increased human population.
2. An increase in illegal harvest of fish and wildlife.
3. Increased hunting and fishing pressure.
4. Increased vehicle-wildlife related mortality, and,
5. Increased human harassment of wildlife.

Impacts will not be restricted to the STSAs. The DEIS, as required by NEPA, must address these indirect impacts.

Alternative 2 -- Low Commercial Production

Specific Analysis of STSAs

Asphalt Ridge/Whiterock STSA

14.36 Terrestrial Wildlife

(page 166, column II, paragraph 3) A discussion of low level impacts to big game has been omitted. If this means no impacts are anticipated, it should be stated for clarification. Otherwise, potential impacts need to be addressed.

14.37 Volume II: Leasing Category Amendments

On p. 74, paragraphs 3 and 9. Stipulations (such as those found on p. 74) are designed to protect important big game range by restricting exploration, drilling and other development activity during certain times of the year. These stipulations need to also address the impacts to big game range that occur during operation and maintenance of tar sand strip mines.

DEPARTMENT OF NATURAL RESOURCES

Volume I

Chapter 3

14.38 The Circle Cliffs STSA contains the wolverine petrified wood areas not mentioned in the draft EIS.

14.39 Hill Creek is on the Nationwide Rivers Inventory. In the Circle Cliffs STSA, the WSA is the North Escalante Canyons WSA. The Gulch ISA is part of this WSA.

14.40 The WSA noted as Horseshoe Bend (UT-050-237). P. 63, in the Tar Sand Triangle STSA is the Horseshoe Canyon WSA (UT-050-237).

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Chapter 4

14.41 P. 115 Table 4-8

Circle Cliffs: The Gulch ISA is part of the North Escalante Canyons ISA.

14.42 Sunnyside: The table should include Jack Canyon WSA and Turtle Canyon WSA.

14.43 Tar Sand Triangle: Horseshoe Canyon National Park is not a separate park but rather is called the Horseshoe Canyon Detached Unit of Canyonlands National Park.

14.44 White Canyon STSA

The preferred Alternative (2) for this STSA should recognize that the Utah 95, Bicentennial Highway cuts through part of this STSA. The Bicentennial Highway was constructed and designated a Scenic Highway as Utah's contribution to the National Bicentennial celebration. It is, perhaps the most spectacularly scenic highway drive in Utah and is in the heart of Utah's scenic and recreational lands. The scenic values for which this highway was designated cannot be lost, as suggested in Alternative 2. This is inconsistent with the designation and future potential of this highway for promoting and developing tourism.

Circle Cliffs STSA

Alternative 4 should be the preferred alternative rather than Alternative 3. It would only limit development by 5.5 to 11 percent, but would provide better resource protection for the surrounding lands.

14.45 The Volume II does not include the Tar Sand Triangle STSA. It should do so if it is to represent a Regional EIS.

UTAH DEPARTMENT OF TRANSPORTATION

14.46 (page 164, Volume II, lines 21-22) Refers to the obliteration of U.S. Highway 191 and other county roads. The outright obliteration of these roads would be unacceptable to the state. Mitigation strategies must be offered to maintain specific travel routes and restore these routes upon completion of the operation.

14.47 The Regional DEIS should have an overview of induced traffic congestion with reference to expected potential bottlenecks and offer specific mitigation strategies to specific transportation problems.

OFFICE OF PLANNING AND BUDGET AND
DEPARTMENT OF COMMUNITY AND ECONOMIC DEVELOPMENT

The BLM should be congratulated for making some good improvements

Comment Letter 14

over previous impact statements. The documents include considerably more detail than previous efforts with respect to socioeconomic analysis. The documents include analysis at the community level, which many EIS's to date have been deficient of. Also, more information on the socioeconomic impacts were presented in these documents as compared with previous impact statements, consequently making them more valuable for planning purposes.

14.48 However, there is concern over the results of this EIS. The impacts identified are of such a magnitude that it would appear that the development alternatives as outlined in the EIS are unrealistic. The communities would be hard pressed to accomodate the magnitude of development identified. Therefore the EIS is inadequate in the sense that it does not address realistic tar sands development alternatives.

In addition to this weakness, there are some particular deficiencies within each document. These particular deficiencies will be addressed below.

Regional Draft EIS - Volume I

14.49	pg. 65	Argyle Canyon/Willow Creek STSA - Inadequate cultural surveys leave significant question as to whether serious impacts would occur.
14.50	pg. 66	Circle Cliffs STSA - Inadequate data on cultural resources provides no basis for assessing the impacts of leasing.
14.51	pg. 67	Sunnyside STSA - Inadequate data.
		General - The affected environment of cultural resources on the area is weak with no documentation of data and with significant data gaps.
		Socioeconomics - affected environment - generally quite complete with excellent identification of data sources.
14.52	pg. 73	The headings on table 3-19 are not self explanatory. School age, retirement age and work age should be defined in terms of years.
14.53	pg. 114	Environmental Consequences - cultural resources analysis is superficial and doesn't provide adequate data to make a differential decision among the various levels of impacts.
14.54	pg. 116	Fiscal Conditions - A comprehensive fiscal analysis is lacking. This gap provides no basis for determining whether the need for increased services as identified throughout Chapter 4 could be met by increased revenues.
		Fiscal Conditions - S.B. 170 requires a comprehensive fiscal mitigation plan be prepared but does not have any enforcement power.

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14.55 pg. 117 & pg. 157 — In table 4-9 and 4-21, impact projections are shown as increases above the baseline. However, at this point the baseline projections have not been identified. It might be appropriate to present the baseline projections in the affected environment section or provide a reference to where the baseline projections can be found.

14.56 pg. 181 — In table 4-28, a number of projects are listed as baseline projects. These include a number of oil shale or coal mine projects. This table is in serious error. None of these projects are or should ever be considered baseline projects. Furthermore, the baseline projections shown in this section are not consistent with these projects. These projects are included in a group of projects referred to in the Sunnyside EIS as "Interrelated Projects." This table should be removed from the EIS.

14.57 pg. 239 — In Appendix 7, county- and community-specific information is identified. However, the analysis is particularly weak. We would congratulate BLM for including community-specific data in the EIS, but the analysis should be taken further to be more conclusive as to the degree of significance of the impact. For example, Sunnyside is projected to increase from a population of 611 to 1049, an increase of over 72%. It would be extremely difficult for any community to undergo that type of growth, yet no analysis of this kind is found in the EIS.

14.58 In general, this EIS contains some good improvements over previous impact statements and a far more adequate job is done of assessing the socioeconomic affected environment and forecasting future demands on infrastructure than is done in the Sunnyside EIS. However, the lack of a fiscal impact analysis leaves this document inadequate as a decision-making tool. It is not sufficient to state that additional services will be necessary. To adequately assess impacts and to develop a mitigation methodology requires a thorough forecast of additional capital expenditures that will be required, as well as additional revenues generated.

14.59 Also, this EIS does not contain any discussion of "Interrelated Projects" or a cumulative analysis as found in the Sunnyside EIS. That is, what would be the impact if tar sands development were to occur at the same time as a number of oil shale or coal development projects, (i.e. a worst case scenario). Although it is recognized that such a scenario is not likely to occur, it nonetheless should be examined to establish where the limits to development might be so planning can occur accordingly.

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STATE OF UTAH
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
Utah Water Pollution Control Committee
150 West North Temple, P.O. Box 2500, Salt Lake City, Utah 84110-2500

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Calvin K. Sudweeks
Executive Secretary
Rm 410 (801) 533-6146

January 18, 1984
533-6146

Roland G. Robison
State Director
Bureau of Land Management
Utah State Office
136 E. South Temple
Salt Lake City, UT 84111

Dear Mr. Robison:

On January 16, 1984, our Bureau received a copy of your 3 volume draft EIS regarding "Utah Combined Hydrocarbon Regional Draft EIS". Since the response date is January 18, 1984, we had insufficient time for a thorough review and our comments will be short; but, we hope they will also be meaningful. They are listed below:

14.60 1. Your draft EIS does NOT appear to address groundwater problems as they relate to the State or Federal Underground Injection Control (UIC) program. It is essential in a discussion of the energy hydrocarbons that the problems associated with UIC, monitoring and surface and groundwater pollution be addressed. A copy of our Part VII Regulations regarding the State UIC program is enclosed for your benefit.

14.61 2. The Utah Division of Environmental Health should have been one of the State agencies requested to comment on the draft EIS. Within that Division are contained the Bureau of Water Pollution Control, the Bureau of Air Quality, and the Bureau of Solid and Hazardous Wastes. Each of these Bureaus should have had the opportunity to review the Draft EIS.

Thank you for this opportunity to comment of the Draft EIS.

Sincerely,

UTAH WATER POLLUTION CONTROL COMMITTEE

Calvin K. Sudweeks
Executive Secretary

enclosure
JRR:jg

An Equal Opportunity Employer 96-4

14.1 As to the comment regarding the direction the Combined Hydrocarbon Leasing Program is taking, it is important to note that program direction is not determined by EIS assumptions and regional production scenarios. That is why the EIS does not propose a preferred alternative in Volume 1.

Regarding the prototype lease concept, BLM does not intend to set leasing levels by converting only certain oil and gas leases. The market place will ultimately determine these levels.

Whatever plans of operations are approved, appropriate mitigation measures will be implemented to protect resource values.

BLM agrees there is a lack of site-specific data to determine the exact extent and nature of impacts. This is why Volumes I and II are Regional EISs. However, the EIS does present the best estimate of what impacts will occur. The EIS contains various assumptions and guidelines necessary to present a reasonable estimate of impacts to satisfy NEPA requirements.

14.2 A geologic map of the tar sand deposits is not included in the EIS; however, Volume 1, Table 3-10 provides area extent of bitumen, number of principal bitumen zones, gross thickness of resources, overburden thickness, and gross in-place bitumen estimates. If the reader desires, there are additional literature sources concerning geology in Utah (i.e., Campbell and Ritzma, 1979; Ritzma, 1979; USDI, MMS, 1980 and 1982).

14.3 At the present time, not enough is known about the tar sand resource in the State of Utah to be able to determine how much bitumen these deposits actually contain. Most data points are widely spaced, and the deposits are not homogeneous enough to make a reliable estimate for most of the STSAs. The figures quoted in this EIS are considered conservative, but may still be inaccurate by a factor of 10 (see Volume III, Table 1-1).

14.4 The stripping ratio used in this EIS to determine which areas could be surface mined is 10:1 or less (see Volume I, Appendix I). The deposits mentioned in this comment are all felt to be potentially surface mineable since the stripping ratio would be less than 10:1. These depths (up to 700 feet) are estimated to be the maximum depth at which the deposits could be surface mined and, therefore, represent the maximum impact to other resources which could result.

14.5 The chemical composition of the sand which contains the tar varies greatly statewide because of the many origins of the sand. Chemical composition of overburden is even more variable because a number of stratigraphic units (sandstones, shales, limestones, etc.) make up the overburden. This information has been added to Volume I, Chapter 4, Alternative 1 (Regional Overview), Tar Sand section.

At this time it is not possible to determine which, if any, salts or metals would be released from the tar, spent sand, or overburden. Details on these potential contaminants would be required prior to approving a pilot or production facility. It is anticipated that the potential for contamination would vary from one part of the state to another because of the mining or recovery methods and the physical characteristics of the bitumen recovered.

Response Letter 14

individual operators would be required to monitor and prevent contamination of surface water and groundwater.

14.6 Tar sand development in Utah is in a conceptual stage and the impact analysis of this development is necessarily conceptual. The analysis in this EIS represents the best available effort at regional impact assessment based on the nature of the tar sand resource and known technology.

Every time an action is proposed on Federal land, a detailed plan of operations will be required from the developer. Site-specific impact analysis will be done based on these plans. The present EIS satisfies our legal requirement for a regional analysis, which is necessarily general in nature and shows cumulative impacts.

14.7 If it is implied by the EIS that there is an "urgency" to lease tar sand, it is not intended. The EIS is meant to be an objective analysis of impacts resulting from possible tar sand development. Note that the EIS provides a No Leasing/No Action Alternative. Tracts do not have to be leased hastily or prematurely because there is provision in the No Action Alternative for future leasing, based on additional planning.

14.8 There are data gaps on specific resources and the viability of development methods. Where such gaps exist, assumptions and projections have been identified and used in the analysis. NEPA does not require that all information be available as long as a carefully reasoned analysis of environmental impacts can be derived with the information on hand. Volume I of this Regional EIS presents such an analysis for three possible scenarios. This analysis gives a general indication of the magnitude of impacts which could occur under each scenario. It is expected that actual tar sand development will be adjusted and refined and will not precisely follow any one of the scenarios.

14.9 The primary and secondary particulate standards have been exceeded in the Price/Wellington area in the recent past. For example, in 1977 the primary 24-hour particulate standards (260 micrograms per cubic meter [$\mu g/m^3$]) and the secondary annual particulate standards (60 $\mu g/m^3$) were exceeded at Price. Any additional dirt road traffic would further increase the problem. It is difficult to quantify the effects of population on fugitive dust generation from dirt roads. In this impact assessment, a one-to-one relationship between population increase and fugitive dust generation from unpaved roads was adopted. Based on this assumption and the expected three-fold increase in population for the area, approximately two-thirds of the dirt roads must be paved to meet the secondary particulate National Ambient Air Quality Standards (NAAQS) in the year 2005.

14.10 The impact analysis contained in this EIS confirms the commentor's assessment. However, tar sand extraction and processing is an emerging technology, as is the control technology to minimize emissions. It is possible that future improved technology could permit the volume of tar sand development as analyzed in this EIS.

14.11 For consistency throughout the regional overview, the EIS analyzes the alternative production ranges of high commercial, low commercial, and no action, based on best available estimates known at this time. At some future time, if the actual recoverable resource were developed, the Prevention of Significant Deterioration (PSD) permitting process would determine the precise scale of production permitted under NAAQS.

14.12 Refer to Oral Testimony Response 1.

14.13 Private lands are not part of the Federal leasing program, and any numbers referring to them were not included in the totals in Volume I, Table 2-2. However, these figures have not been ignored and are included in parentheses in that table.

The developments on State and private lands were included in the baseline and are a part of the cumulative analysis for all alternatives. In cases where less certainty of development exists, these projects were included in Appendices 3, 5, 7, 8, 9, and 10.

14.14 The text in Volume I, Chapter 3 of this Final EIS has been amended to read that most STSAs are in rural areas which are not close to major pollution sources. The ambient air quality in Table 3-1 incorporates existing air pollution sources currently affecting all STSAs considered in this EIS.

14.15 Volume I, Chapter 3 of this Final EIS has been corrected to show the population estimate for herd unit 28A to be 7,440 animals.

14.16 The bald eagle is shown as occurring within the P.R. Spring STSA in Volume I, Table 3-12 of this Final EIS. In addition, the text has been corrected to show that four golden eagle nests occur in the Raven Ridge/Rim Rock STSA.

14.17 Volume I, Chapter 3 of this Final EIS has been corrected to show the Book Cliffs elk herd size to be 1,035 animals.

14.18 The estimated acres of surface disturbance calculated in the two EISs were derived from two widely different assumptions. The estimated 100 acreage of riparian habitat (Volume I, page 56 of the Draft EIS) has been changed to 925 acres in this Final EIS. Also, refer to General Response 1.

14.19 Volume I, Table 3-13, "Fisheries Within STSAs," has been revised in this Final EIS to include brown trout in Grassy Trail Creek.

14.20 The species list from FWS for the combined hydrocarbon leasing did not include the bonytail chub as a species which may be present in the concerned area (see Volume I, Appendix 4). According to the USDI, FWS (1982), the only recognized pure population of bonytail chub occurs in Lake Mohave, Arizona.

14.21 Because reptiles, amphibians, and nongame birds were not identified in the scoping process or during EIS preparation as significant resource issues, these animal groups were not discussed in this EIS. Only significant resources, resource uses, or environmental consequences are discussed in this EIS. This is in accordance with Section 43 of the Code of Federal Regulations (CFR) 1500.2(b), which instructs Federal agencies: "...to reduce paperwork and the accumulation of extraneous background data; and to emphasize real environmental issues and alternatives." For an impact to be significant, it must substantially affect the human environment, be of high public concern, be controversial, or be covered by law.

Response Letter 14

14.22 A discussion of impacts on the enforcement workload of conservation officers has been added to Volume 1, Chapter 4, Alternative 1 (Regional Overview), Socioeconomics section of this Final EIS.

14.23 Refer to Letter Response 14.18 and General Responre 1.

14.24 Because of a lack of site-specific data regarding concentration, calving, fawning, and other high use areas, coupled with the fact that actual plant site locations have not been identified, this approach was the only way to quantify impacts and, therefore, was used for analysis purposes only. It is realized that this assumption could either over or understate impacts to big game populations, depending upon actual site locations of surface-disturbing activities.

14.25 Refer to Letter Response 14.24.

14.26 Because of insufficient data, the assumption was made that big game were evenly distributed over their crucial range. This approach enabled BLM to estimate impacts to big game. Given this assumption and because impacts were analyzed assuming that all surface disturbance would occur on crucial range, BLM believes the EIS does provide a worst-case scenario as required by NEPA.

14.27 Refer to Letter Responses 14.24 and 14.26.

14.28 Volume I, Chapter 4 of this Final EIS has been corrected to show that the Asphalt Ridge/White Rocks STSA contains crucial deer winter range.

14.29 The statement regarding the elimination of various wildlife populations refers only to those populations that are dependent upon unique or limited wildlife habitat types (i.e., riparian areas, aspen communities, etc.) and not to wildlife populations throughout crucial ranges. Also, refer to Letter Response 14.24.

14.30 Refer to Letter Response 14.21. Because deer and antelope populations are widespread, only impacts to their critical habitat (crucial range), as identified by Utah Division of Wildlife Resources (UDWR), are considered significant resource issues for this EIS. Because of their low population levels in the Raven Ridge/Rim Rock STSA, impacts to these animals were not expected or discussed.

14.31 Volume I, Chapter 4 of this Final EIS has been corrected to show that there are four active golden eagle nests in the STSA.

14.32 Refer to General Response 1 and Letter Response 14.18.

14.33 Refer to General Response 1.

14.34 Impacts to Grassy Trail Creek reproductive and nursery habitats have been included in the Aquatic Species section of the High Commercial Production Alternative in Volume 1, Chapter 4 of this Final EIS.

14.35 The text has been changed to include "wanton killing" after "harassment" in Volume 1, Chapter 4 of this Final EIS. Volume 1, page 110 of the Draft EIS, specifically stated that: "Tar sand development could impact wildlife populations directly (i.e., loss of habitat) and indirectly (i.e., human activity such as increased hunting pressure, harassment, poaching, and off-road vehicle [ORV] use)."

The following statement has been added to Volume 1, Chapter 4, Animal Life section in this Final EIS: "It is important to note however that, depending on the extent of development, indirect impacts to wildlife populations or habitats could equal or exceed direct impacts in some cases (Thomas, 1983)."

14.36 The text has been corrected in Volume 1, Chapter 4, Asphalt Ridge/White Rocks STSA section of this Final EIS to include impacts to big game.

14.37 Once a mine went into operation, seasonal stipulations would not apply because it would not be possible to manage the area for big game protection at that time.

14.38 Volume 1, page 64 of the Draft EIS, does state that the Circle Cliffs STSA contains the Wolverine Petrified Wood Area.

14.39 The final Nationwide Rivers Inventory list of river segments that qualify for study for inclusion in the National Wild and Scenic Rivers System does not include Hill Creek (USDI, NPS, 1982).

North Escalante Canyons/The Gulch Instant Study Area (ISA) is a single area and will be so addressed in the Utah Statewide Wilderness EIS. See Volume I, Chapter 3, Circle Cliffs section of this Final EIS for a discussion on this ISA.

14.40 The error has been corrected in Volume 1, Chapter 3 of this Final EIS.

14.41 This change has been made in Volume 1, Chapters 3 and 4 of this Final EIS.

14.42 Two thousand acres of the Jack Canyon WSA (UT-060-070) overlap the Sunnyside STSA. The Turtle Canyon WSA (UT-060-067) is located 5 miles south of the Sunnyside STSA. Range Creek, a potential water source for tar sand operations, flows through both the STSA and the Turtle Canyon WSA. There could be indirect impacts to this WSA from air and water pollutants. Both WSAs have been included in Volume 1, Table 4-8 in this Final EIS.

14.43 This correction has been made in Volume I, Table 4-8 in this Final EIS.

14.44 In Volume II, page 103 of the Draft EIS, the discussion of impacts on visual resources does address the scenic significance of the White Canyon STSA and Highway U-95. No alternatives discussed in Volume 1 project any tar sand development in the White Canyon STSA. Also, no plans of operations have been received for this STSA.

14.45 As stated on Volume 1, page 11 of the Draft EIS, the tar sand leasing categories for the Tar Sand Triangle STSA have already been determined for the Henry Mountain Resource Area and the Glen Canyon NRA, which governs administration of the STSA. Some amendments to the Resource Area MFP decisions are considered in the "Unit Plan of Operations for the Tar Sand Triangle Combined Hydrocarbon Lease Conversion Draft EIS" (USDI, NPS, 1984).

14.46 It is acknowledged that specific transportation mitigation would be forthcoming from additional environmental assessment prior to any on-the-ground development. Volume II, Chapter 2, Land Uses and Land Use Plans section has been revised to indicate that rerouting and relocation of U.S. Highway 191 and other county roads could be required by tar sand development.

14.47 Transportation-related impacts from the high commercial alternative are discussed in Volume 1, pages 123-124 of the Draft EIS; impacts from the low commercial alternative are found on pages 163 and 165.

14.48 The high and low development alternatives were based on an aggregation of production estimates supplied by industry (see Volume 1, Appendix 1) and are realistic because they were made using the best available information known at the time. It is agreed that the analysis contained in this EIS shows major impacts to some communities and counties.

14.49 The data presented in the Draft EIS were compiled largely from existing inventories conducted in or near the STSAs. It represents the best data available, although there are data gaps.

The Regional EIS, however, does not clear the way for development in the STSAs. It is simply an overview of what can reasonably be expected to occur if the STSAs are developed. Every time an action is proposed, a detailed plan of operations must be submitted by the lessee. Site-specific environmental analysis will then be required. Please refer to the Cultural Resources Memorandum of Understanding (Section III.B.1) contained in Volume 1, Appendix 6, and Volume III, Appendix 5.

14.50 Refer to Letter Response 14.49.

14.51 Refer to Letter Response 14.49.

14.52 Volume I, Table 3-19 of this Final EIS has been amended to show school age, retirement age, and work age as part of the demographic characteristics.

14.53 Refer to Letter Response 14.49.

14.54 The socioeconomic impact analysis acknowledges the need for a fiscal impact analysis as required by Utah Code Annotated Section 63-51-10, Supplement 1981. However, fiscal analysis in that Code is a process separate from the EIS process and is most relevant when performed immediately preceding on-the-ground development.

14.55 Baseline projections can be found in Volume 1, Tables 4-28 and 4-29 of this Final EIS.

14.56 Volume I, Table 4-28 of the Draft EIS shows interrelated projects that are not included in baseline projections. This table has been deleted from Alternative 3 of this Final EIS. Summaries of interrelated projects have been added in Volume I, Appendix 10 to differentiate the effects of these projections from baseline projections. It should be noted, however, that any list of interrelated projects is constantly changing and can be expected to differ in forthcoming site-specific EAs or EISs.

14.57 Volume 1, Chapter 4, Socioeconomic sections contain additional analysis.

14.58 Refer to Letter Response 14.54.

14.59 Summaries of interrelated projects have been added as Volume I, Appendix 10 of this Final EIS. For greater details concerning interrelated projects and associated cumulative analysis, refer to the "Socioeconomic Technical Report: Regional Analysis of Tar Sand Development in Utah" (Argonne National Laboratories, 1983). The projected socioeconomic baseline analyzed in this EIS is composed of normal growth and various projects that are reasonably expected to occur. Other interrelated projects outside the projected baseline are considered speculative and, therefore, considered in the appendix for possible cumulative effects of tar sand population-induced scenarios.

14.60 Additional information has been included in this Final EIS to cover surface and groundwater problems as they relate to State and Federal regulations. Mention of the Underground Injection Control program is made in this addition. Refer to Volume I, Chapter 4, Alternative 1 (Regional Overview), Water Quality (Surface and Groundwater) section. Also, refer to Letter Response 7.1. The applicability of State and Federal regulations would be better defined as plans of operations are analyzed by an EA or EIS on a site-specific basis.

Response Letter 14

14.61 The Utah Division of Environmental Health has been added to the List of Agencies and Organizations Requested to Comment on the Final EIS. The responsibility for distributing the Draft and Final EISs for comment lies with the State of Utah Clearinghouse, Office of the Governor. Comments from the Utah Division of Environmental Health were submitted by the Office of the Governor (see Letter Comments 14.9 through 14.12).

UTE INDIAN TRIBE
UINTAH AND OURAY AGENCY
Fort Duchesne, Utah 84026

In Reply:
Energy & Minerals

January 13, 1984

Roland G. Robison
State Director
Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr. Robison:

Enclosed are the comments of the Ute Indian Tribe for your consideration of the adequacy of Utah Combined Hydrocarbon Regional Draft EIS as a planning and decision document. We appreciate the opportunity to provide these comments to you.

15.1 It was extremely disappointing to have learned from our technical staff of the nearly complete lack of discussion in this document of issues pertinent to the Ute people residing on the Uintah and Ouray Reservation. Air Quality issues discussed in the document is the only adequate section where tribal consideration occurred. Our tribal technical staff spent considerable time providing information to BLM during scoping sessions to assure appropriate inclusion of the Ute Tribe in this EIS and thereby providing the Ute Tribal Business Committee with a document that would be useful as a "decision and planning" tool. While working closely with the BLM on the Uinta Basin Synfuels Development EIS, it became apparent to all involved parties that considerable lack of data existed on the Ute people and their reservation for the EIS process. In recognition of that, BLM conducted a study specifically to address those data gaps. It was further recognized that not all of the data necessary could be collected in a single study. Therefore, the BLM provided for a second study related to Ute attitudes over rapid, large-scale development of energy resources (included in the Bibliography of this document). BLM representatives specifically stated to tribal representatives that data gaps on the Ute Tribe would be filled via a building process through continued efforts of the EIS processes and the construction of EIS documents. This has not occurred with respect to this document. If anything has occurred along these lines, it has been a reversal of attitudes and near total lack of address to issues important to the Tribe, and previously expressed to BLM by tribal representatives.

15.2 Socioeconomic information conducted by Argonne National Laboratories is wholly inadequate in addressing the tribal service areas and conditions.

15.2 cont. Not a single contact was made by Argonne National Laboratories with the Ute Tribe. It is impossible to understand this complete lack of attention to such important issues. Especially when it is known that past staff members of Argonne National Laboratories did conduct and publish studies of socio-economic conditions in Indian Country and specific to this reservation and the Ute people.

15.3 The Ute Tribal Business Committee, acting within their authority of federally-recognized sovereignty has established the Hill Creek Extension of this Reservation as a "Cultural and Wildlife Resource Protection Area." This information was specifically provided to BLM for consideration. No mention is made of this in the document. In fact, on page 62, Volume 1, the following statement appears:

> "Hill Creek STSA: There is no present or potential wilderness inside the STSA; however, the Winter Ridge WSA (UT-080-73) is located immediately (0.25 miles) to the east."

15.4 It is not understandable as to why this draft EIS does not provide discussions of tribal issues comparable to those afforded the affected counties and communities of the State.

The following additional comments and questions have been prepared for the Ute Tribe via technical assistance request of the Council of Energy Resource Tribes (CERT) and are herein included for your comment.

Respectfully,

UTE TRIBAL BUSINESS COMMITTEE

D. Floyd Hopsock, Chairman

CHC:gw

INTRODUCTION

The environmental and socioeconomic components of the Utah Combined Hydrocarbon Draft Environmental Impact Statement (DEIS) were reviewed. The DEIS addresses the following aspects of tar sand development in Utah:

- general levels of lease-conversion and tar sand development;
- federal land use planning; and
- additional competitive lease.

The Ute Tribe recognizes the development potential of hydrocarbon resources in Utah. The tribe also recognizes that some degree of experimentation with tar sand development must be authorized to help fill information needs and that a level of development must be authorized if we and our neighbors are to continue to enjoy this part of the country, our homeland and a base for our way of life. Integral to our enjoyment of our homeland is protection of environmental resources: the air, the water, the fish, the wildlife, the land, and the setting. Thus, we appreciate this opportunity to continue our involvement in evaluating tar sands development on areas within and adjacent to the Uintah-Ouray Reservation in terms of its direct and indirect effects on the Ute Tribe.

Our reviews of the various phases of the Combined Hydrocarbon leasing program have been multi-faceted, with all disciplines involved. The information presented in the DEIS is broadly based and represents the degree anticipated at an early stage of an evolving technology. The incompleteness of resource inventories, coupled with the unanswered questions regarding environmental impacts of tar sands development, make it difficult for us to properly advise the Department on the preferred approach in this multi-faceted program. On the one hand we do not wish to delay development in order to obtain inordinate amounts of data. On the other hand, we do not wish to advise proceeding with a long-term commitment where there is a high risk that the necessary environmental protection associated with that commitment cannot be assured.

We recommend that approvals be phased to allow substantial decisions regarding the environmental acceptability of tar sand extraction and upgrading in the STSAs to be made in a step-wise manner.

15.5 The Ute Tribe has concern that water and product pipeline routes and electric transmission line routes are not discussed in the DEIS. These routes, if proposed for Uintah-Ouray Reservation lands, or other sensitive areas, can have adverse impacts on local environment in the affected areas. The Ute Tribe is similarly concerned that no discussion of refinery capacity for the projected production is present in the DEIS. We remain concerned that pipelines and increases in refinery throughout will have additional reports on water uses. If the tar sands production is to replace more conventionally-produced crude supplies, adequate justification of this concept should be provided.

It is important to recognize, for any developments, that the Ute Tribe is a separate and distinct geopolitical entity which controls its own natural resources and that they can exercise far greater control over their own culture, economy, governments and environments. Therefore, we believe the tribe should continue to be involved in the tar

sands development program, including the resource-by-resource assessments that lead to designation of exploration procedures, pilot facility designs, and commercial facility designs. Most air quality issues raised by the tribe at technical meetings held prior to the publication of the DEIS were addressed. We recommend such technical sessions be held for other environmental issues. By being involved, the tribe will be better able to deal with critical and sensitive areas of concern.

AIR QUALITY

The air quality components of the Draft EIS for the Utah Combined Hydrocarbon Regional Development were reviewed. The DEIS indicates that the proposed development would have an impact on the air quality values of the Uintah and Ouray Reservation. Pursuant to earlier comments made by the tribe at meetings held on the technical aspects of the analysis, the document attempted to address most of the issues raised by the tribe. The dispersion methodology used is acceptable, appropriately subscribing to sound scientific principles utilizing best available information. The tribe commends the BLM for the open and responsive approach taken in addressing the tribe's air quality concerns. The following comments are made in order to resolve the remaining issues in the Draft EIS.

15.6 Although the general analysis is adequately performed, the modeling approach could understate maximum worst-case local ambient air quality impacts. Use of worst-case modeling impacts for the regional scale can only be used in the general sense in making decisions concerning the cumulative air quality "carry capacity" of proposed development. Accordingly, the general approach used in the EIS may not be directly compatible with the existing regulatory decision process used by the EPA and state agencies in permitting air pollution sources. Also, the results of this regional analysis, using generalized short-term meteorological data, may not necessarily coincide with the results of analyses required by permitting agencies who ultimately make key air quality decisions.

15.7 An important conclusion implied from the DEIS is that the combined air quality impact of the proposed synfuel development described in the Uintah Basin Snyfuels Project EIS with the proposed tar sands development in the area would substantially degrade the air quality of the reservation (particularly the visibility values) and could possibly inhibit the Ute Tribe from development.

Specific Comments on DEIS Document:

	Page	Paragraph	Comment
15.8	3	-	The map of the Uintah and Ouray Reservation needs to be more clearly defined.
15.9	30	-	The statement is made that the resulting air quality impacts could limit other air polluting projects in the area. The air quality impacts could be more significant than indicated for the Uintah and Ouray Reservation.

	Page	Paragraph	Comment
15.10	96	-	Table 4-2. The incremental impact to the Uintah and Ouray Reservation for Argyle Canyon, Asphalt Ridge, Hill Creek and P. R. Springs seem low, since many of these sites are adjacent to (or coincidental with) the reservation. Of particular interest was the Hill Creek site which is located primarily on the reservation. The question remains: Why is Hill Creek STSA consumption on the reservation only 26% of the total 3-hr. SO_2 increment consumption? The most significant ambient air quality impact to the reservation occurs from the potential development at P. R. Springs. It is assumed that this consumption occurs in the Hill Creek extension of the reservation. Further detail (with isopleth maps) showing the incremental relationship of the Hill Creek STSA and the P. R. Spring STSA would be helpful. Is there any overlap of the isopleths from each of these projects?
15.11	131	11	Significant visibility impacts would occur on the Uintah and Ouray Reservation due to P. R. Spring. Would this visibility impact extend into the proposed tribal wilderness designated area of the Hill Creek extension?
15.12	176	7	The "no action" alternative indicates that PSD increment consumption could still occur in the Hill Creek STSA irrespective of tar sand development.
15.13	235	4	The use of the VALLEY Model is appropriate for short-term analyses. However, the use of F stability and light wind (2.5 meters per second) will tend to underestimate the air quality impact locally for those more unstable conditions.

WATER RESOURCES

Analyses of water resources impacts were conducted keeping in mind the relative proximity of the various STSAs to the Uintah-Ouray Reservation and the anticipated concern of the Ute Tribe for protection of water resources on and off the reservation. Use of water resources and degradation of water quality was presumed to have a potential to place direct or indirect regional pressure on water resources currently used, or which may be used by the tribe (including sale to other users).

15.14 One of the concerns of the Ute Tribe is the potential effect that the proposed and alternative actions may have on the region's water resources (pp. 2, 5 and 8). As has been expressed in many forums, the tribe recognizes the actual and potential surface-water shortages that both nature and development such as tar sands produce, and the potential for equally-substantial effects on groundwater supplies. Based on the location of many of the STSAs in relation to the reservation, our analysis of the effects on water resources includes geographically-distant and secondary impacts (such as increased demand for water storage and diversions from upstream locations to supplement depleted water supplies in the STSAs, deterioration of local water quality due to water withdrawals during operations and due to salt loading to tributary streams after mining and reclamation as groundwater flows are reestablished and flow through backfilled sand and waste rock or leached zones is initiated). Since portions of the Pariette STSA, Asphalt Ridge/White Rocks STSA, and Hill Creek STSA are adjacent to and within the boundaries of the Uintah-Ouray Reservation, we also examined more local effects of land disturbances and shallow groundwater impacts where development was proposed in these STSAs. The potential effects of tar sands development on water resources in these STSAs on the reservations could be greater than those caused by operations in other STSAs. The greater potential for impacts stems from localized erosion, interference with stream flow into the reservation, disturbance of the local aquifer system, and the possible effects of trespass on the reservation with all the inherent adverse effects of unauthorized entry.

15.15 It is recognized that the appropriated water rights listed for analyses (such as in the Regional Analysis) are often in excess of the amount presently used. We nonetheless caution that the various water development scenarios reviewed (pp. 2 and 5) for the entire region (84,000 and 17,000 acre/feet/year) would appear to be capable of causing significant adverse impacts on the tributary drainages, especially during low flow periods. This is of concern to the Ute Tribe because (1) it would adversely affect the environment which tribal members enjoy, and (2) it may place premature pressure on the tribe to develop its water resources.[1]

15.16 The potential adverse impact on water resources identified throughout the EIS (Vol. 1) is the diminution of flows and the increase in salinity caused by consumptive use of relatively good quality water (e.g., p. 103). The additional potential adverse impact not addressed by the EIS (Vol. 1) is that of an increase in salt-loading to streams as the shallow groundwater system is reestablished after mining and reclamation. While one could hypothesize that tar sand and associated sedimentary strata that are disturbed by mining are relatively benign in terms of oxidation and subsequent release of soluble salts, so might one have hypothesized "no-effect" for western surface coal mining operations a few years ago. Now the potential for salt loading from areas mined for coal and reclaimed is well recognized (see for example, pp. 141-146, Draft Environmental Impact Statement-Coal-Green River-Hams Fork Region, Round Two (prepared for competitive coal leases), USDI-BLM, 1983). While the relative increase in salinity projected for coal mine areas is not large in comparison to increases caused by irrigation return flows and some natural sources, the effect on intermittent streams and the headwaters of perennial streams could be high and could help create a longer-term degradation of water quality (see also pp. 163-4 "Uintah-Southwestern Utah Coal Region Round Two Final

[1] The premise is that any decrease in water supply in the Green River drainage will place pressure on the tribe to make available its water resources or will reduce the flexibility of the tribe to use its water resources to its best advantage.

15.16 cont. Environmental Impact Statement" (prepared for competitive coal leases) USDOI-BLM, 1983). This post-mining potential in salinity increases as a result of tar sands extraction should be examined.

15.17 We have further concern that the water use requirements for tar sands development are extremely speculative, and therefore, that impact analyses are also extremely speculative (p. 8). We see no evidence in the DEIS that projections of water use were based on technically-sound assumptions. For example, there is no reference to boiler feed water, cooling water, coke sluicing water, water for coke dust control, fire-control water, or general coke plant water needs in the DEIS. These water needs would be characteristic of a coking unit. In addition, the technical assumptions used to calculate water requirements for tar sands extraction, mining (e.g., fugitive dust control), or reclamation do not appear. Rather a ratio relating bitumen production to water requirements is used. We believe that available data that support the water use estimates should be presented for review in order to better evaluate estimated water use requirements, and related impacts. If these data are in the applicant's submissions, the data should be extracted and reported.

15.18 Further, there are no water storage assessments. The conversion proposals will require almost constant water supplies for operating periods. It is likely that streamflow in many of the areas is too low during baseflow periods to be expected to provide the relatively large quantity of water estimated for tar sands facilities. Thus, one would anticipate that water storage would be required. Considering both the need for adequate water rights to allow storage, the generally important character of the area for fishery habitat, and the presence of the endangered Colorado squaw fish and humpback chub and the "sensitive razor-back sucker" (p. 38, DEIS, Vol. 1), the topic of storage is important and should, we believe, be better scoped, through discussion of quantities to be stored, the pipeline and power transmission routes considered, and possible locations in the region. Obviously, evaporation, sedimentation, and seepage are other factors to be considered in these assessments. In the case of the Argyle Canyon STSA (p. 123) and the Sunnyside STSA (p. 137), the need for storage is mentioned. However, no analysis of the effects is evident.

15.19 We have some concern over the assumption that there will be no discharge of process water. We are not certain that tar sands technology currently provides for total recycle throughout the entire process and thus, evaporation or deep-well disposal may be contemplated. We are concerned that inadequate area exists for evaporation and that evaporation of large quantities of water implies large ponds which may be situated in areas of shallow groundwater recharge. If the water cannot be treated or discharged, its introduction to the shallow groundwater system without treatment does not appear appropriate without substantial prior assessment. Disposal of accumulated salts and organic material after evaporation or treatment does not appear to be adequately addressed. Disposal of coke, if the coke characteristics or market will not facilitate sale, is not addressed in the DEIS.

15.20 The DEIS-Regional Analysis utilizes estimates of water quantities projected to be withdrawn from various sources (Table 1 in Konwinski, 1983, "Utah Special Tar Sands Areas, Their Water Requirements and the Future Effect on the Colorado River System", USDOI-BLM-Denver EIS SVC and reproduced in part as Table 4-4 of DEIS, Vol. 1). These have been grouped to facilitate the estimates of salinity charges using the Colorado River Simulation System (see Konwinski, 1983 and summary of model in "Colorado River Simulation System - An Executive Summary", US Bureau of Reclamation, Oct. 81). This

15.20 cont. grouping does not identify water shortages in the headwater drainages where many of the tar sands development projects would be located. This need for further refinement of water impacts is exemplified in Table 3-6 of the DEIS, Vol. 1. This table lists numerous streams in each STSA that might be sources of water. The vast majority of the listed streams are not individually represented in the model. Thus, local salinity impacts are not evaluated. But these impacts could be anticipated to be found quite important as more detailed development information becomes available and a better understanding of local effects on tributary streams is gained. As noted earlier, the effect of additional reservoir storage for tar sands development does not appear (explicitly) to have been taken into account (which may derive from the lack of an explanation of the technical assumptions for the water use numbers rather than an omission).

The salinity and flow model does appear to have accounted for numerous "projected depletions", including an estimated 84,000 af/yr of "Deferred Indian" water starting in 2000 (DEIS, Vol. 1, p. 219, Appendix 3). Konwinski (1983 in Appendix to that paper), reports that this amount includes 45,000 af/yr for irrigation of 1324 acres from Leland Bench and 39,000 acre feet for irrigation along the White and Green Rivers. The tribe appreciates incorporation of these projections. It is also noted that the DEIS - Regional Analysis is based on the assumption that the White River dam will be in place by 1990 (Konwinski, 1983 - Appendix). The DEIS calculations presume oil shale development and water withdrawals from the Reservoir and the White River. The Ute Tribe has noted its concern regarding the projections of water use for oil shale in the Uintah Basin. And to emphasize the concern, we quote from the DEIS for "Uintah Basin Synfuels Development" (BLM, 1983, p. R-3-23; see also p. P-3-26).

> "The White River currently has no storage, and because of this, shows extreme variation in flow. In addition, the flow of the White River from Colorado to Utah could be reduced by an unknown amount due to future water storage and other water use in the headwaters of the White River. The Ute Indian Tribe has (an) unquantified water right along the Lower White River...The Duchesne River is heavily used in irrigation and is undergoing development for out-of-basin export."

The regional water depletion and water quality model was run for the combined hydrocarbon development scenarios using a rise in depletions to 166,000 acre ft/yr by 2000 for the Bonneville Unit - Central Utah Project (Konwinski, 1983, Appendix).

15.21 We are concerned that the potentials for development of tar sands on other lands (private and state) are not considered as part of the baseline (p. 11, DEIS, Vol. 1), or as part of the effect of the alternative other than "no action". We think that a more scientific assessment of the potential for additional water demands to be fostered by development on non-federal lands would be appropriate for this type of analysis. It is not clear as to how much oil and gas production are projected to take place concurrent with the tar sands development. Thus, we find it difficult to conceptualize cumulative impacts. We are also concerned over the potential impacts to fisheries in the affected drainage basins.

15.22 In regard to fisheries, we have analyzed Table 3-13 of Vol. 1 and the text to find that the table does not appear to reflect the effect of development on "fisheries" per se. That is, a number of entries are missing from that table since (apparently) they probably are not classified "sport fisheries". For example, activities in the Argyle Canyon STSA would potentially affect the White River; in the Hill Creek, they would affect the White River

15.22 cont. and Willow Creek; in the Tar Sands Triangle STSA could affect the Colorado River; in Circle Cliffs STSA, they could affect White River and Willow Creek; in the Raven Ridge STSA, they could affect the Green and White Rivers, and in the San Rafael Swell STSA, they could affect the Green River. We should note that the text at page 113 does a much more eloquent job of addressing adverse affects on stream flow than does any preceeding hydrologic analysis.

15.23 The Ute Tribe has particular concern over control of erosion and effects on streamflow in the STSA's closest to the reservation (Hill Creek, Pariette, and Asphalt Ridge/White Rocks). But first, in a more general sense, we note that while the impact analysis for erosion suggests a range in soil disturbance, and an increase in erosion, from 13,550 to 51,300 acres between the two production scenarios (Alternatives 2 and 1), the ensuing section on soils states that 72,100 acres would experience increased sediment yields (p. 105) in the Alternative 1 scenario. The 51,300 acre figure agrees with Table 4-6. Please explain. We observe that few of the rated soils (Table 3-8) have good reclamation potential. (Note that no ratings are given for a number of the soils.) Despite the statement on Page 37 to the effect that sediment yields are not "extremely high", we feel that the DEIS does little to allay concerns over low reclamation potential and substantial need for employment of sophisticated stabilization techniques, including geomorphic considerations, to control erosion. We recommend that more data indicating the procedures to be used, tested, or strongly considered should be in this EIS. These requirements, once identified, should be carried through to development plan reviews, possibly as lease stipulations.

15.24 The water use requirement of these tracts near the reservation, though small in comparison to areas such as the Sunnyside STSA, may have greater impact on the tribe because of their proximity. (The Pariette STSA is not being considered in lease conversions. However, it is being considered for competitive leasing and is addressed in our comments on Volume 3 of the DEIS). Thus, our concerns previously expressed over the impacts of consumptive uses are especially important for these areas. Those concerns include the lack of analyses of the effect of water depletions on the tributary streams. The effect of actions analyzed for the two STSAs in which conversions are proposed, Hill Creek and Asphalt Ridge/White Rocks, are projected to be those of in-situ development and the surface disturbances accompanying drilling and construction and operation of surface facilities. The tribe is also concerned over the potential for surface mining in the southern part of the Hill Creek STSA (p. 49 of DEIS, Vol 1). The relative unsuitability of this area for surface mining should be determined, given the erosive rocks (Table 3-8, p. 44 of DEIS, Vol 1), and the proximity to Willow Creek, an important water supply for the tribe.

15.25 With respect to the effects of the in-situ development of tar sands analyzed in the DEIS, we believe the DEIS is deficient in the adequacy of the projections of the effects on the groundwater system in the Hill Creek STSA (p. 130) and, likely, the Asphalt Ridge/White Rocks STSA (p. 126). The springs and shallow aquifers in the Hill Creek STSA and the shallow aquifers in the vicinity of the Asphalt Ridge/White Rocks STSA (Table 3-6, p. 41) are of concern. If the Pariette STSA is reconsidered, the same concern exists for that area. We believe better data describing the groundwater system of all the tracts and surrounding area are required to assess the acceptability impacts associated with commercial-scale development. At a minimum, collection of the hydrologic data necessary to make proper evaluations should be mandated prior to each phase of tar sands operations (exploration, pilot facility, and commercial).

Comment Letter 15

15.26 Surface disturbance associated with drilling and surface facilities must be carefully planned to control erosion. It is recommended that the special stipulations (Appendix 2, pp. 213-4, of DEIS, Vol. 1) be better tailored in consultation with the Ute Tribe for site specific application to the Hill Creek and Asphalt Ridge/White Rocks (and, later to the Pariette STSA). The consultation is important in coordinating actions taken by BLM with those of the Ute Tribe.

15.27 Since many of the Wilderness Study Areas (WSAs) contain flowing streams which add to the wilderness potential, we are concerned over the apparent encroachment of the STSA's and lease conversions on these study areas. Thus, tar sands development becomes one more pressure on these Wilderness Study Areas as is briefly noted in the DEIS (pp. 5, 113). However, this summary does not note diminution of streamflow and deterioration of water quality. The Circle Cliffs STSA, Hill Creek STSA, and Tar Sand Triangle STSA contain, or are immediately adjacent to, WSAs. While we recognize the nonimpairment standard, we cannot but feel that sixteen WSAs (including National Parks - Table 4-8) is a very significant number and that the DEIS should more thoroughly analyze adverse impacts - including water resource degradation in each and available mitigation measures. This need extends to those rivers listed on the Nationwide Rivers Inventory (Table 3-15).

SOILS AND VEGETATION

15.28 Although some soil surveys were listed, the DEIS made minimal use of them. Maps on soils and vegetation were omitted. A more thorough description of soils and vegetation is needed to determine the feasibility of mitigating the adverse impacts.

Specific Comments:

	Page	Paragraph	Comment
15.29	8	9	"Degradation,...Land Masses" In the first sentence the words "soils and vegetation" should be inserted between "surface" and "and" to give it more clarity.
	8	9	"Degradation,...Land Masses:" "The extent of rehabilitation cannot be predicted" is stated. Will the FEIS contain additional data to enhance a determination on mitigation?
15.30	11	3	The DEIS states conversion application approval based on submission of a plan of operations would include a description of a "reasonable environmental protection" portion. This EIS is deemed not to contain sufficient baseline and mitigation information. "Reasonable environmental protection" should be discussed in detail. What measures are being taken to ensure the "reasonable environmental protection" plan will be included in the approval procedures?

Comment Letter 15

	Page	Paragraph	Comment
15.31	30	Table 2-4	In the "Vegetation" row, under "Irreversible" Column, "no" is entered although a "permanent loss of soils" would occur. A permanent loss of soils would indicate an irreversible impact. The "no" should be changed to "yes". In the event the case is still "no" then the word "some" should be inserted between the words "of" and "soil".
15.32	37	12	Salinity classes for soils are presented. The classes are established for agricultural purposes. Some discussion should address salinity effects on native plants considered for re-vegetation.
15.33	53	4	Vegetation description would be enhanced if range sites were identified.
15.34	93	2	The "Table 2-3" mentioned in the last sentence should be "Table 2-4".
15.35	93	4 (#1)	Will the permitting process be included in the "laws" and "regulations" mentioned here?
15.36	105	10	Acreages in different classes of sediment yield and salinity are computed. The type of impacts and the potential for reclamation of these soils by class should be addressed.

WILDLIFE RESOURCES

15.37 The description of the affected wildlife and their habitat was too general and sometimes lacking. For example, the Asphalt Ridge/White Rocks STSA within and adjacent to the reservation was not addressed. Until site-specific wildlife information is collected, the potential impacts of the proposed development on the wildlife resources cannot be fully evaluated.

Specific Comments:

	Page	Paragraph	Comment
15.38	55	Table 3-12	The White Rocks area is considered critical winter range for both mule deer and elk.
15.39	56	1	Bighorn sheep in the Desolation Canyon should be addressed due to its close proximity to Sunnyside and Hill Creek STSAs.

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	Page	Paragraph	Comment
15.40	56	3	There are known sightings of black bear in the Hill Creek area. VTN Colorado (1977. Final Environmental Baseline Report, White River Shale Project. Denver Co: U. S. Bureau of Mines) reported that mountain lions are common in the East Tavaputs area which includes the Hill Creek area.
15.41	94	Assumption #12	Because deer and elk generally concentrate in certain customary use areas within their seasonal ranges or critical habitats, the assumption that deer and elk are evenly distributed throughout their entire crucial range should not be made.
15.42	111	1	Disturbance of summer range in herd unit 28D (Hill Creek) could result in decline of deer population in that area.
15.43	111	2	The impacts on elk in the Hill Creek area should also be addressed.

SOCIOECONOMICS

General Comments

15.44 The assessment of the regional socioeconomic effects appears to have been conducted rigorously and in accordance with generally accepted "state-of-practice" methods for the counties and communities in the study region. The analysis of the effects on employment, income, population, and infrastructure needs was conducted quantitatively for seven counties and the associated subcounty CCD's and school districts.

Unfortunately, no such comparable investigation was conducted for the only sovereign geopolitical entity in the region: The Uintah-Ouray Reservation. While counties and even communities were accorded individualized treatment in the document, the reservation--which includes within its boundaries, significant portions of Duchesne, Uintah, and Grand counties--was not even mentioned. The Indian people, their employment and income characteristics, and the facilities and services of the reservation are ignored by this document.

15.45 A similar problem arose in the preparation of the Uintah Basin Regional Synfuel Development EIS. In both the PDEIS and DEIS, the Uintah-Ouray Reservation, its infrastructure and the Indian people residing there were effectively ignored. In that instance, the BLM, recognizing the oversight, agreed to underwrite a study of the socioeconomic conditions and possible impacts on the reservation. No less attention to the socioeconomic concerns of the Ute Tribe and their reservation is expected in this document. The Ute Tribe, as evidenced by their establishment of a Socioeconomic Impact Monitoring office, is genuinely concerned about the potential effects of development on or adjacent to the reservation.

15.45 cont. Given the substantial failure of this document to address reasonably the socioeconomic impacts on the Ute Tribe and the Uintah-Ouray Reservation, a major effort will be required to bring the assessment of impacts on the reservation up to the standards used in the assessment of impacts in other, smaller jurisdictions. It is strongly recommended that this process, which may take up to six months, begin immediately.

Specific Comments:

	Page	Paragraph	Comment
	71	2	The regional overview presents a characterization of the: (1) demographic trends, (2) employment and income, and (3) infrastructure.
	86	15	While the reservation is not recognized as a separate entity for purposes of impact analysis, the authors are at least aware of its existence. It is mentioned that the tribe "....is more cautious in its support of tar sand development".
15.46	116-123	All	At the very end of a comprehensive analysis of the net effects of tar sand development on the seven counties and their communities is found the only overt reference to the Uintah-Ouray Reservation. It is expressed, in the section dealing with attitudes and lifestyles, that "Ute tribal members not participating in the economics benefits of tar sand development would feel a heightened sense of cultural and economic alienation". This observation is not sufficient to thoroughly analyze tribal attitudes and is inappropriate.
15.47	156-163	All	At the conclusion of the comprehensive analysis of the net socioeconomic impacts of Alt. 2 tar sands development on the seven counties and their communities and special districts, the same inappropriate comment regarding Ute tribal members is found.
15.48	Document		In its socioeconomic assessment the document fails to recognize the existence of the reservation as a separate and distinct geopolitical entity even though it is recognized as separate, distinct, and sovereign by the federal government. The following are minimal requirements needed to complete the socioeconomic assessment of tar sand development in the region:

	Page	Paragraph	Comment
15.48 cont.			• A separate evaluation of the baseline socioeconomic conditions and impacts expected within the exterior boundaries of the Uintah-Ouray Reservation;
			• An enumeration of the facilities and services provided on the reservation and our analysis of the effects that tar sand development will have on each;
			• A complete demographic profile of the reservation including the numbers of people available to work;
			• A forecast of the employment and population effects of tar sand development on the reservation and the following services and facilities:
			- housing - tribal government - police and fire - emergency medical - schools - water and sewer - solid waste.

VOLUME 2

Volume 2 of the DEIS presents four tar sand leasing categories being considered for use in seven of the eleven STSAs and analyzes the effect of assigning these leasing categories to different areas of tar sand resources and for various degrees of facilitating tar sand development. The leasing categories under consideration are:

- Category 1: open to leasing with standard stipulations;
- Category 2: open to leasing with standard and special stipulations[1];
- Category 3: open to leasing with no surface occupancy;
- Category 4: closed to leasing.

The following comments address this volume.

San Rafael Swell pp. 46-65

15.49 The area is characterized as having a great deal of near-vertical rock faces, cliffs, and sandstone ridges where reclamation would be difficult, as would erosion control (p. 46). Since it is very difficult to distinguish specific steep slope areas on the Figures of the DEIS, and to correlate these areas with the tar sands locations (Fig. 2-5, p. 54), one cannot determine the areas with high erosion potential which coincide with areas of surface-mineable tar sands, or with likely areas of facilities and access routes to mines. Further, we cannot determine if the Category 2 designations, and accompanying stipulations overlap the areas of high erosion potential. In the same manner, we cannot determine whether Category 3 and 4 areas provide protection for these areas. The procedure of classifying the entire STSA for tar sands when many areas do not contain tar sands is compounded by the omission of oil and gas development information. For example, we note, from the text (p. 50), that Cane Wash has springs, but then it would appear that the area has no tar sand deposits (Fig. 2-5). Then, our examination of the Alternatives did not provide any information of either the need for, or the protection afforded, the Sinbad well.

15.50 The San Rafael river area designation is discretionary; that is, the land manager may change the prohibition under certain circumstances. Doesn't this discretion conflict with the Wilderness Study Area category of the southeastern portion of the leasing Category 2 designation?

Sunnyside South pp. 66-92

15.51 The results of activity planning reported for this STSA seem to represent a great deal of thought. But it is extremely difficult to identify and evaluate the bases for the various designations. To begin with, there are no tar sand resource maps and, thus, we do not know the most likely activity that will occur. Again, this deficiency is compounded by
15.52 the lack of information on oil and gas potential. The analysis acknowledges the importance of the hydrologic system but the various scenarios of development are not consistent in their treatment of the subject. That is, the stipulations vary from Alternative to Alternative. One cannot determine if adequate protection is given. For example, area 123, a Deer Winter Range, is Category 1 in Alternative 1, is Category 2 for 11,615 acres in Alternative 2 (stipulations allow oil and gas development only and require steep slope protection), continues as Category 2 for 11,575 acres for Alternative 3, but stipulations change to require limited surface mining and adds an aquifer protection requirement, and then, under Alternative 4, 12,088 acres are afforded Category 2 protection with the accompanying stipulations allowing in-situ mining (only) and maintaining the aquifer protection requirement. The lack of adequate explanations for the area reduction creates concern that the designations are arbitrary. The groundwater protection stipulation contained in Areas, 116, 119, 120, 121, and 123 is intriguing. Why is there not a similar stipulation for area 110 (Sunnyside Water Supply)?

White Canyon pp. 93-104

15.53 The discussion indicates that there are no hydrologic issues. The text does indicate (p. 99) that there is a spring in Short Canyon (located below the tar sands deposits). While Alternatives 2 and 3 designate this area or at least adjacent areas, as Category 2, the stipulations are oriented to protect Bighorn sheep and visual resources. Thus, we are not certain that erosional effects on the canyon or the effects of mining on the spring have
15.54 been incorporated into the designations. And, as is the case for most of these STSA

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15.54 cont. discussions, we are not provided information on the tar sands locations or on oil and gas development. Thus, we do not know the likelihood of surface disturbance or subsidence on the Short Canyon area.

Circle Cliffs pp. 105-126

15.55 The apparent effect of the progression of lease category assignments through the various Alternatives is to move the mining toward in-situ and then to close certain areas for lease. In view of the potential for in-situ to harm aquifers and the characteristically poor recoveries associated with in-situ, one must question whether it truly makes sense to project underground mining or in-situ for these tracts at this time.

15.56 Figure 2-15 (p. 106) shows the Wolverine Petrified Wood Natural Area at Category 3 for Alternatives 1 and 2. Yet the text indicates that it is Category 1 for Alternative 2. What is the disposition of this area for the Alternatives and why? The same question applies to the Escalante Canyon Outstanding Natural Area, since it is shown on the Figure as Category 3, but is not accounted for in the text until Alternative 3.

We agree with the Sensitive Watershed classification and the limits (to oil and gas production only) proposed as Alternative 4. This appears, from the information provided, to provide protection to Capitol Reef National Park.

Asphalt Ridge pp. 127-142

15.57 Groundwater is found in the upper, shallow aquifers of this STSA. The text indicates that local flow and aquifer properties are not known. None of the stipulations or the leasing category designations recognize groundwater, nor do the designations adequately flag the need to control erosion in this location (near the Green River). Since in Vol. 1, groundwater is considered the source of water for operations, one might expect a more thorough analysis of groundwater at the STSA.

Pariette pp. 143-154

15.58 Note that the three designations of Category 2 protection for wildlife, watershed, and golden eagle are for the same area (under Alternative 3).

15.59 It is not clear why stipulated or category protection was removed from the east part of the Pariette tract. Please explain basis. This, again, is a tract for which oil and gas development and tar sand deposit data were not given and the assessment of relative importance of productive measures is not possible.

Argyle Canyon pp. 155-164

15.60 It is noted that the Ashley Forest is not represented by categories on the maps. What is
15.61 the status of the planning effort for the Forest? The lack of oil and gas production
15.62 regulations and tar sands map again makes it very difficult to determine the adequacy of the plans. As in previous STSAs, we cannot be certain if adequate protection of water resources since the groundwater system is not described. It would appear that the risks of erosion are sufficiently high to defer this STSA through use of Category 4 designations for soils and steep slopes, or to develop site-specific criteria and control measures as site-specific stipulations.

Sunnyside North pp. 164-177

15.63 The categories appear to be well thought out, but it is difficult to judge whether the proper stipulations have been applied to the proper areas from the standpoint of protection of the competing resources. For example, a major drainage channel passes through T11S, R15E, but no hydrologic protection stipulation (Floodplains and wetlands) are recommended for the Township. Stipulated protection is designated for an archaeological inventory, a vegetation inventory, and protection of visual resources but not for water resources. With respect to the stipulated protection for springs, it is not clear the 600' buffer will protect springs. More hydrogeologic information is required to assess impacts on the springs.

15.64 It is observed that certain of the acreages designated in Table 1-4 (p. 23) do not specifically agree with those listed for each of the STSAs in Chapter 2 (e.g., Asphalt Ridge, Pariette, Argyle Canyon, and Sunnyside-North). Please identify "correct" acreages.

15.65 The amendments to the land use planning categories for tar sand leasing do not provide adequate information from which the Ute Tribe can evaluate the potential effect of changes in the leasing categories on groundwater resources. The potential impact on watersheds and erosion control is identified as a major issue (p. 1, DEIS, Vol. 1) and is addressed well for most STSAs in Chapter 2. But we are concerned that the scarce water supplies in the Pariette STSA may not be adequately protected under any of the Alternatives (pp. 23-27, 29, 143-154). The DEIS states, "Local and area wide water flow direction and properties of the aquifers are not known" (Vol. 2, p. 149). This lack of important information requires deferral of assessments of impacts. With regard to the surface water protection requirements proposed (pp. 143-153), we believe the watershed requires a high degree of protection. However, we cannot ascertain that adequate protection is afforded by the area descriptions shown in the maps of the various STSAs (e.g., pp. 144-146). We would be most willing to review the resource data used to develop the area lease designations with the BLM to determine the appropriate categories and stipulations. Otherwise we cannot recommend approval. We point out that the acreages

15.64 cont. in Table 1-4 do not agree with the acreages in Chapter 2. See, for example, "No Action" Alternative-Table 1-4 which states 8,871 and 5,200 acres for the Pariette STSA and 7,112 and 5,200 acres on page 143. This appears to be related to the inclusion of private ownership in Table 1-4 and not in Chapter 2. Please explain.

We do not oppose the proposed oil and gas activity, the only development considered in the DEIS for this STSA (Pariette), provided such operations are planned to protect water resources. We agree that tar sands extraction needs to be evaluated further before authorizing tar sands operations. We believe this should be done in cooperation with the Ute Tribe.

15.66 The Asphalt Ridge/White Rock STSA analysis addressed only those areas of the STSA located near Vernal and not those adjacent to the reservation. Again, we are concerned over the apparent lack of adequacy of groundwater data used for the analysis (p. 133). Further, special stipulations designed to control erosion are appropriate for this area given the proximity to the Green River.

15.67 With regard to the San Rafael Swell STSA, we believe special stipulations need to be employed to control erosion and that the stipulations should be applicable to all areas of high erosion potential rather than just to the riparian areas, (pp. 50-55, specifically, p.

15.67 cont. 50, floodplain stipulation). This concern also applies to the Sunnyside STSA Southern area (p. 78), the White Canyon STSA (p. 99), the Circle Cliffs STSA (p. 114, and the Argyle Canyon/Willow Creek STSA (p. 160).

15.68 Our concerns over the inadequacy of groundwater data at this stage of the land use planning process also applies to the San Rafael Swell STSA (p. 53), south portions of the Sunnyside STSA (pp. 78 and 172 - water resources are not directly discussed for this STSA), the White Canyon STSA (the adequacy of groundwater data is not reviewed), and Argyle Canyon/Willow Creek STSA (p. 160).

Given these concerns, the tribe supports the establishment of leasing categories giving the BLM land manager the best possible tools to make tar sand (or oil and gas) development compatible with protection of scarce water supplies and to maintain critical water supplies during development. We encourage dissemination of resource data for the lands to the affected public, including the tribe, such that we can make more reasoned appraisals of the adequacy of data bases.

VOLUME 3

This volume of the DEIS examines five alternatives for competitive leasing of up to 18 tracts in STSAs in Utah. Six of the tracts have no tar sand resource analyses (Sunnyside 10, Sunnyside 11, Sunnyside 12, Pariette 1, Pariette 2, and Pariette 3). Thus, they are evaluated only in terms of conventional oil and gas development. The following comments address this volume.

15.69 The proposed competitive leases in the Pariette STSA occur in close proximity to the Uintah-Ouray Reservation (see map, p. 30, Vol. 3). The Pariette #1 tract lays within the drainage of Wells Draw, which drains into the Uintah-Ouray Reservation. Thus, potential for surface water impacts to occur directly on the reservation is of concern. The area is proposed to be leased under category 1 under the high development scenario (p. 16). It is presumed that the stipulations listed on page 81 following the heading "Surface Disturbance Stipulations for Combined Hydrocarbon Leases" will be utilized. No other stipulations are identified as proposed. Though only conventional oil and gas leasing is contemplated in this STSA at this stage, we need additional site-specific information to enable agreement with the seemingly vague lease proposals for control of adverse impacts on water resources. We believe that consideration should be given to careful planning and control of transportation routes across drainages. The hydrologic information provided for this tract, the other Pariette tracts, and, for that matter, all tracts, makes it very difficult to evaluate the adequacy of proposed control measures. If adequate detail is contained in Tract Site Specific Analyses, these analyses should be included with the DEIS. If adequate hydrologic data are not included, the data should be obtained.

15.70 If one tries to correlate the proposed tracts described in Volume 3 with the lease-area designations proposed in Volume 2 of the DEIS, it is extremely difficult (e.g., comparison to Table 2-1 of Vol. 3 and Table 1-4 of Vol. 2). The tribe considers this interrelationship

15.71 between MFP categories and "activity planning" one that the DEIS should clearly present and explain. For example, the maps of Chapter 2 of Volume 2 should be correlated with an expanded version of Figures 1-1 through 1-4 to identify the site-specific mitigation measures appropriate to provide adequate protection of water resources.

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15.71 cont. With respect to tracts within the Sunnyside STSA, we are not certain, given this difficulty of correlating the actions discussed in Volume 2, with those discussed in Volume 3, that adequate protection is given to watersheds, springs, or shallow aquifers and we believe the analyses in the DEIS should be clarified. For example, it would appear that the analysis of competitive tract Sunnyside 7 ignores the various Category 4 leasing designations presented in Volume 2 and instead presumes that Category 2 applies. We believe this decision may be premature. The BLM may respond by indicating that the decision-maker may choose to provide further protection to tracts such as Sunnyside 7. This response would merely cloud the issue since it is reasonable to anticipate that the decision-maker will not have adequate resources to comprehend the various permutations possible, especially since the environmental factors are distributed through three volumes.[2] Thus, the proposed competitive lease tracts should be analyzed

15.72 for each of the Alternatives presented in Volume 2. And the anticipated production levels should be related to Volume 1. Further, the reasonableness of the assumptions regarding independent operation of Sunnyside #1 and combination of other tracts with other leases (as opposed to independent operation) should be assessed more diligently (p. 50). Can you realistically assume that an increase in water consumption rates and surface disturbance rates will not occur with the development of all other tracts?

15.73 This lack of clarity in the DEIS presentation makes it very difficult for us to develop useful recommendations regarding mitigation measures. This difficulty may tend to force us to select the more restrictive scenarios (vis-a-vis tar sands development), or to recommend even more restrictive scenarios. We would prefer to recommend an acceptable level of controlled development and, therefore, request opportunities to review a water resources data base of greater detail than is provided by the DEIS.

[2] The acreages indicated as protecting the Sunnyside municipal water supply is given as 640 acres on page 53. Reference to Volume 2 shows designations (this watershed) to be as follows: Alternative 1: 2,320 acres in Category 4; Alternative 2: 440 acres in Category 4; Alternative 3: 2,400 acres in Category 2 with stipulations requesting consultation; Alternative 4: 2,400 acres in Category 4. What is basis for 640 acres?

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15.1 Most of the socioeconomic analysis in this EIS was derived from the BLM-commissioned study: "Socioeconomic Technical Report: Regional Analysis of Tar Sand Development in Utah" (Argonne National Laboratories, 1983). The Uintah and Ouray Indian Reservation is analyzed in this report, and much of the baseline information originated from the "Final Socioeconomic Technical Report, Uintah Basin Synfuels Development" (Utah State Energy Office, 1983), "Ute Attitudes Regarding Energy Development in the Uintah Basin" (Duncan, 1983), and output from the Utah Process Economic and Demographic Impact Model (Argonne National Laboratories, 1983).

This EIS is a regional overview and, as such, focuses socioeconomic issues primarily on a county level. Uintah and Ouray Reservation impacts are included in the county totals. Volume I, Chapters 3 and 4 in this Final EIS have been expanded to include specific information on the Reservation and Ute Tribe.

15.2 The Ute Tribe was involved through the scoping process to identify tar sand issues. Additionally, BLM personnel met with tribal representatives to implement an attitudinal and lifestyle study relative to future energy development (Duncan, 1983). The Interagency Agreement between Argonne National Laboratories and the BLM stipulated that secondary data (e.g., a literature search and existing information) would be used, where possible, to save cost and time because of the statewide effort required.

15.3 The analysis in Volume I, Chapter 3, Hill Creek STSA, Wilderness section of this Final EIS reflects this information.

15.4 Refer to Letter Response 15.1.

15.5 Plans of operations would have to be submitted by interested companies before pipeline routes, electric transmission line routes, and similar concerns could be addressed in detail. A general analysis of pipelines has been added to Volume I, Chapter 4, Alternative 1 (Regional Overview), Transportation section in this Final EIS. The Ute Tribe would be involved in any action which affected the Reservation, as described in Volume I, Appendix 2, Surface Disturbance Stipulations for Combined Hydrocarbon Leases section, Item 2.

A discussion of refinery capacity for the projected production was not included in this EIS because it is not known which refineries would be used. At the present time, Salt Lake City refineries are functioning below capacity. Refinery capacity would also depend on market locations, which are undefined at this time.

For the "justification" of tar sand production, refer to Volume 1, Chapter 1, Purpose and Need section.

15.6 As discussed in Volume I, Chapter 4, Alternative 1 (Regional Overview), Air Quality section, the analysis was performed to estimate the general magnitude of air quality impacts resulting from alternative levels of development in the STSAs. The analysis was performed to comply with NEPA rather than regulatory analyses required for new sources under the Clean Air Act. The PSD permitting process that would occur if tar sand were developed would be more

detailed than the EIS analyses. The EIS assumed hypothetical facilities, unproven technologies, and tentative locations for development. Because these parameters will become more refined before PSD permitting processes are complete, the results may change. BLM believes that a worst-case analysis was presented in Volume I, Chapter 4, Alternative 1, High Commercial Production.

15.7 BLM agrees with the comment. The analyses for both the Uintah Basin Synfuels Development EIS and this EIS predict a general deterioration of air quality values, PSD increment consumption, and atmospheric discoloration at the Uintah and Ouray Reservation. It is possible that increment consumption both on or adjacent to the Reservation could limit future trihal development of energy resources on Reservation lands.

15.8 The Uintah and Ouray Reservation appears in the grey shaded areas on Summary Figure 1 (Volumes I and II) and also on Figure 1-1 (Volume III) of this Final EIS.

15.9 It is true that tar sand projects could use up the PSD increment for the area, thus limiting future energy projects such as conventional oil and gas development on Reservation lands. The models used to predict air pollution impacts in this EIS are mathematical simulations based on best available production estimates known at this time. Future energy market conditions and a comprehensive exploration program will eventually determine actual production.

15.10 Proposed development at Argyle Canyon is expected to occur 10 to 15 kilometers (km) south of the Uintah and Ouray Reservation. The most severe sulfur dioxide (SO_2) impacts would occur on high terrain near the development. At Asphalt Ridge, proposed development is expected along the northern border of the Reservation. The most severe SO_2 impacts would occur on high terrain north of the development in Ashley National Forest.

It is true that the majority of the Hill Creek STSA lies within the Uintah and Ouray Reservation; however, development is expected only on the eastern side of the STSA outside the borders of the Reservation. The most severe impacts would occur in the vicinity of the facility, which was assumed to be 7 km east of the Reservation. SO_2 increment consumption at the Uintah and Ouray Indian Reservation would range from 20 percent of the annual Class II increment to 51 percent of the 24-hour Class II increment.

The most significant ambient air quality impact to the Reservation would result from the potential development at P.R. Spring STSA which lies east of the Hill Creek Extension of the Reservation. Additive effects from concurrent development of P.R. Spring and Hill Creek STSAs would increase the annual SO_2 increment consumption from 4 ug/m^3 to 6 ug/m^3 at the Hill Creek Extension of the Reservation. However, short-term (3-hour and 24-hour) increments (26 percent) would not likely be affected by concurrent development since wind direction in this instance is not conducive to additive effects.

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There would be isopleth overlap of 24-hr SO_2 concentrations under the high production scenario and annual average total suspended particulates (TSP) concentrations under the high and low production scenarios.

15.11 The observer point used in the visibility analysis was Flat Rock. This land feature is located within the proposed tribal wilderness designated area of the Hill Creek Extension. Level-2 visibility screening indicates that significant visual impacts could occur at Flat Rock from nitrogen oxide (NOx) emissions of tar sand development at P.R. Spring. It must be emphasized that, for analysis purposes, all the NOx emissions within P.R. Spring were combined to form a single plume and all NOx emissions were treated as nitrogen dioxide (NO_2).

15.12 It is true that PSD increment consumption could still occur with projects other than the tar sand development analyzed in this EIS.

15.13 The VALLEY model was chosen to estimate maximum short-term impacts in complex terrain because of the screening nature of the analysis. The model performs well identifying potential threats to the short-term ambient air quality standards in complex terrain (Burt, 1977). VALLEY underestimates impacts under certain circumstances; however, for consistency, the model was applied to all cases. As long as there is local terrain at or near the elevation of the effective plume height, maximum short-term impacts would occur during stable conditions. If an area of concern were located below the plant site, stability Class D and light winds (2.5 miles per second [m/sec]) were assumed in the modeling analysis; thus, estimates of short-term impacts in those instances were considered.

15.14 Estimated water requirements for high and low commercial production levels are shown in Volume I, Tables 2-2 and 2-3, respectively. Tar sand development would require conveyances of water rights and would result in other impacts to the water resource as discussed in Volume I, Chapter 4 (refer to the Water Resources section for each STSA).

Impacts to localized erosion, stream flow, and local aquifers resulting from tar sand development have been discussed in Volume I, Chapter 4. No tar sand development is projected for land on the Uintah and Ouray Reservation. However, it can be expected that, as population increased in Uintah and Duchesne counties, unauthorized entry on the Reservation and other crime would increase. This is reflected in Volume I, Alternative 1 (page 123 of the Draft EIS), which states that: "...police officers and patrol cars would increase from 3 to 95."

15.15 Impacts to tribal water rights were not addressed in the Draft EIS. However, tar sand development and the subsequent water requirements could result in requests for water of which the Ute Tribe has rights.

The Draft EIS states that, although there is sufficient water to allow tar sand development at the high commercial production

level, most of the water is appropriated, and developers would have to purchase or lease water they did not now own. The above conclusion is also true of the Tribe's water resource. Because the variables are too great for a regional analysis, a determination of points of diversion or of which stream would be used must be discussed on a site-specific level.

An increase in salt loading to streams from a reestablished groundwater system could occur if water from the disturbed strata were unconfined. An addition has been made to Volume I, Chapter 4, Alternative 1 (Regional Overview), Surface and Groundwater section in this Final EIS to indicate this possibility. The potential for and type of contamination would vary, as discussed in Letter Response 14.5.

Some site-specific plans of operations could propose to dewater streams in or near STSAs. However, the study conducted for the STSAs by the USDI, GS (1983), shows that sufficient water exists in the vicinity and that no additional water would be required.

15.16 Refer to Letter Response 14.5.

15.17 Water requirements in this EIS were partially determined by preliminary estimates supplied by interested companies; plans of operations were not available to list a breakdown of individual uses. Where data were not submitted by companies, a calculation was used (see Volume I, Appendix 1). However, this calculation assumed full water use (a worst-case situation), which would probably not occur. Also, refer to Letter Response 2.9.

It should be pointed out that the amount of water needed for tar sand development is still unknown and professionals in the field still do not agree on water needs. The refinement of water requirements will occur on a site-specific level as plans of operations are submitted on a project-by-project basis.

15.18 The discussion of storage in this EIS is conceptual in nature and suggests that storage would be necessary to maintain a high commercial production level in some of the STSAs. Where appropriate, analyses of storage and related impacts would be made on a site-specific basis through an EA or EIS. Plans of operations submitted by companies would be the basis for determining specific storage sites and areas of concern.

The assumption that there would be no discharged water is based on EPA and State regulations.

15.19 Where appropriate, impacts from the disposal of accumulated salts, coke, and organic material will be analyzed on a site-specific basis by an EA or EIS. Tar sand development would be subject to State and EPA regulations, and companies would be required to develop a hydrologic monitoring plan.

15.20 Refer to Letter Responses 14.5 and 15.18. Where appropriate, additional salinity impacts to streams other than the Green and Colorado river systems would have to be analyzed in site-specific EAs or EISs based on plans of operations. It should be noted, as stated in Volume I, Chapter 4, Water Requirements and Effects on Colorado River Requirements section in this Final EIS, that dewatering of some highly saline streams (e.g., Price River) could decrease salinity in the Colorado River system.

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15.21 Baseline data (i.e., air quality, water, and socioeconomics) were gathered on non-Federal lands. Impacts attributed to development of tar sand on STSAs were then added to this baseline data (refer to Letter Response 14.13). Conventional oil and gas production does not normally require substantial water use and, therefore, would not contribute significantly to cumulative water use. Impacts to fisheries were analyzed in Volume I, Chapter 4 of the Draft EIS (pages 111, 126, 127, 129-131, 133, 134, 136, and 138 in Alternative 1 and similarly in the other alternatives). Also, refer to Volume I, Chapter 4, Threatened, Endangered, and Sensitive Plant and Animal Species and Aquatic Species sections in the Draft EIS.

15.22 Volume I, Table 3-13, "Fisheries Within STSAs" (page 57 of the Draft EIS), addresses only "sport fisheries" within the STSAs that would be affected; however, Table 3-14, "Potential Water Sources of Fisheries Outside STSA Boundaries" (page 59 of the Draft EIS), addresses streams and rivers outside STSA boundaries that could be potential water sources for tar sand development.

15.23 The 72,100-acre figure was in error and has been corrected to read 51,300 acres in Volume I, Chapter 4 of this Final EIS. Rehabilitation is discussed in Volume I, Chapter 4, Alternative 1 (Regional Overview), Vegetation section. Also, refer to the Sunnyside Combined Hydrocarbon Lease Conversion EIS, Appendix 1, for a typical discussion of reclamation and erosion control programs. Determination of reclamation potential and susceptibility of an area to erosion would require a site-specific analysis. This would be done after plans of operations were analyzed.

15.24 Since this is a Regional EIS, water quantity impacts to individual streams, with some exceptions, were not analyzed as long as it appeared that water was available. The projected mining method for Hill Creek STSA is in situ. Plans to implement in situ or surface mining would require an EA or EIS on a site-specific basis and would involve contact with affected and/or interested agencies such as the Ute Tribe. The "surface mining in the southern part" you refer to is for the P.R. Spring STSA, not for the Hill Creek STSA.

15.25 The best available data for groundwater was used in the analysis.

15.26 Coordination and cooperation between the Ute Tribe and the affected land-managing agencies should continue as it has in the past. No plans of operations were submitted for lands administered by the Ute Tribe. If such plans were submitted, consultation would be initiated for input with the Bureau of Indian Affairs (BIA) and the Ute Tribe on a site-specific basis.

15.27 Tar sand associated water developments could have significant off-site/tract impacts as noted in the discussion in Volume I, Recreation section, page 113 of the Draft EIS. Streams flowing through WSAs could be impacted. However, until site-specific proposals (plans of operations) are received, analysis of those impacts is not possible. When such specific proposals are received, they will undergo environmental review which will address the concerns expressed and include potential mitigation measures.

15.28 Vegetation and soils were described in the narrative of Volume I, Chapter 3; no maps were felt necessary for this description. No plan of operations to mine tar sand will be approved based solely on the data and analyses presented in this EIS. Where appropriate, an additional EA or EIS will be required for specific plans of operations. These site-specific EAs or EISs will be based on the plan of operations and will contain an in-depth site-specific data base and analyses. They will also contain a complete mitigation program. 43 CFR 3570 states that the plan of operations "will ensure reasonable protection of the environment." A determination as to conformance with this provision will be made in these site-specific documents.

However, site-specific EAs or EISs will be tiered to this Regional EIS. When tiering is utilized, the site-specific EA or EIS will contain a summary of the issues discussed in this Regional EIS. The BLM will also incorporate, by reference, discussions from the Regional EIS. Thus, site-specific EAs or EISs will focus primarily on the issues relevant to the site-specific plan of operations and will not duplicate material found in the Regional EIS.

In summary, the Regional EIS contains a broad data base and analysis with a general description of mitigation. In many instances, adequate site-specific data were not available during development of the Regional EIS for a site- or project-specific description or impact analysis.

15.29 The Unresolved Issues section in Volume I, Summary in this Final EIS has been changed to include the terminology suggested in the comment.

The Final EIS does not contain additional data needed to determine site-specific types of mitigation. Where appropraite, site-specific EAs or EISs will be written, based on plans of operations. Mitigation will be outlined in these documents and will be tailored to specific sites, problems, and operations.

15.30 Refer to Letter Response 15.28.

15.31 Although surface disturbance would accelerate erosion, reclamation procedures could stop the process. Soil lost until reclamation was complete would be irretrievable. The word "some" is added as suggested in Volume I, Table 2-4 of this Final EIS.

15.32 Native plants considered for revegetation of saline areas have to be species adapted to saline conditions. There is potential for a "reclaimed" site to be more saline than it was in its natural state. In such a situation, species adapted to more saline conditions would have to be used in reclamation. The result would be

Response Letter 15

that the range site potential of the area would be changed and could no longer support the plant communities it did prior to mining. This information has been added to Volume I, Chapter 4, Alternative 1 (Regional Overview), Vegetation section in this Final EIS. Note that the topic of chemical changes in topsoils necessitating the use of introduced plant species in reclamation is addressed in Volume I, Chapter 4, Alternative 1 (Regional Overview), Vegetation section. .

15.33 Identification and tabulation of range sites by STSA and by lease tract would enhance the vegetation sections in Volume I, Chapters 3 and 4. However, this information is currently not available for all STSAs. Much of the available information appears mostly in widely scattered, unconsolidated computer printouts, site writeups, and allotment files.

Even if good range site descriptions were included in this EIS, impacts to each range site could not be quantified because the actual locations of the areas to be mined within the STSAs and lease tracts have not been identified.

15.34 This error has been corrected in Volume I of this Final EIS.

15.35 Yes, it is assumed that all appropriate permits will be applied for and issued prior to commencement of any operation. To add clarification to this section, the term "permitting processes" has been added to Volume I, Chapter 4 under the Analyses Assumptions and Guidelines section, Item 1.

15.36 Impacts would occur from tar sand mining and construction activities as discussed in Volume I, Chapter 4, Water Resources, Soils, and Vegetation sections. Reclamation potential would be best in non-saline and slightly saline soils. Reclamation would be most successful in the low sediment yield classes and most difficult in the high and very high sediment yield classes. These high sediment yield areas are generally eroded badland shale areas wth little vegetation in the natural state. Reclamation potentiol would have to be determined on a site-specific basis. This information has been added to Volume I, Chapter 4, Alternative 1 (Regional Overview), Soils section of this Final EIS.

15.37 There are data gaps regarding affected wildlife populations and their habitat, and that site-specific information would greatly enhance an impact analysis. Because of these data gaps, it was necessary to develop various assumptions (i.e., big game are evenly distributed throughout their crucial range and all impacts from surface-disturbing activities would occur on crucial range). These assumptions provide a baseline from which to make our best estimate of environmental impacts from most likely development scenarios.

Specific impacts to wildlife populations and their habitats on the Asphalt Ridge/White Rocks STSA have been updated in Volume I, Chapter 4 of this Final EIS.

15.38 Volume I, Chapters 3 and 4 of this Final EIS have been corrected to show that the Asphalt Ridge/White Rocks STSA is considered crucial winter range for mule deer and elk.

15.39 BLM is aware that the Ute Tribe has reintroduced Rocky Mountain bighorn sheep onto the Uintah and Ouray Reservation and that the bighorn sheep population has increased and is expanding its range into the Floy and Desolation Canyon WSAs. However, because the major sheep use area appears to be in the Rattlesnake Canyon section of the Desolation Canyon WSA and not within either the Hill Creek or P.R. Spring STSA boundaries, BLM does not foresee any impacts that would threaten the success of this reintroduction.

15.40 Black bear and mountain lion have been added as important small game species for the Hill Creek STSA in Volume I, Chapter 3 of this Final EIS. However, because tar sand development on BLM lands is proposed to occur on areas where there is little black bear or mountain lion habitat, impacts to these species were not discussed in Volume 1, Chapter 4.

15.41 Refer to Letter Response 14.24.

15.42 BLM agrees that disturbance on crucial summer range could impact deer populations or habitat. However, because tar sand development on BLM lands is not proposed to occur on areas that are considered crucial winter range for deer and because crucial winter range is not a limiting factor for deer in this herd unit, no impacts to deer are expected.

15.43 Impacts to elk in the Hill Creek areas were not discussed because the proposed tar sand development on BLM lands would occur on winter range, which is not a limiting factor for elk in this herd unit nor for elk oo the Uintah and Ouray Reservation.

15.44 Refer to Letter Response 15.1.

15.45 Refer to Letter Response 15.1.

15.46 The complete statement in Volume I, page 123 of the Draft EIS is as follows: "Ute tribal members not participating in the economic benefits of tar sand development would feel a heightened sense of cultural and economic alienation. Environmental problems (i.e., degradation of air and water) and social concerns (i.e., trespassing on Reservation lands and overcrowding of services) would cause stress among tribal members (Duncan, 1983)." The study by Duncan was based on a comprehensive, representative Ute Indian attiudinal survey commissioned by the BLM and conducted by the Ute Tribe.

It is not the intent of the EIS to present a complete dissertation from each cited reference. Only summary conclusions are presented. References are given throughout the EIS so that interested readers can obtain source data in its entirety.

15.47 Refer to Letter Response 15.46.

15.48 Refer to Letter Response 15.1.

15.49 Oil and gas categorization was completed in an EA on a districtwide basis. Volume II, Figure 2-2, page 48 of the Draft EIS shows categorizations for the San Rafael Swell STSA.

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Specific areas with high erosion potential have not been identified. Best analysis that can be completed for soil erosion without site-specific proposed actions appears in Volume II, page 63 of the Draft EIS. Volume II, Figure 2-5, Tar Sand Deposits (page 54 of the Draft EIS), can be compared with the stipulated areas on Figures 2-1 through 2-4.

As depicted in Volume II, Figure 2-5, Cane Wash is at the elevation below the tar sand deposit. The formation containing tar sand has been eroded away in this area. Refer to Volume II, Environmental Consequences section (pages 63-64 of the Draft EIS) for an analysis of the impacts to the water resource, including Cane Wash.

The Sinbad Well is one of the few water sources in the San Rafael Swell STSA. To protect this well, Public Water Reserve 107, and other legal water sources, the following stipulation will apply to all leases and conversions: "To protect importaot aquifers, all surface and in-situ mining must be preceded by complete hydrological testing and evaluation as specified by the authorized officer of BLM. Any loss of springs or reduction in perennial streamflow will be fully mitigated with an equal quantity and quality as specified by the authorized officer of BLM."

15.50 While areas are under WSA status, they are protected by the nonimpairment provisions of the BLM IMP, which effectively preclude tar sand exploration and development in these areas. If the areas are designated wilderness by Congress, tar sand development would be precluded. If not designated, the areas would be open to leasing with the category 2 stipulation you mote. Further, the San Rafael River in this area is a Nationwide Rivers Inventory segment which qualifies for study for addition to the National Wild and Scenic Rivers System. Therefore, any projects which could adversely affect the natural, cultural, or recreational values of the river would require notification and coordination with the NPS (Council on Environmental Quality [CEQ], 1980). This agency would assist in developing appropriate avoidance/mitigation measures, which would be monitored and enforced as required by CEQ regulations.

15.51 The conventional oil and gas potential is not expected to be impacted by tar sand development. Most, if not all, of the acreage in the Sunnyside and Vicinity STSA is underlain by tar sand, and it is assumed that some type of tar sand development could be proposed anywhere within the STSA (see Volume 1, page 51 of the Draft EIS). The alternatives identified for the Sunnyside STSA are based on different levels of resource protection which range from maximum production to resource protection. The resources protected and stipulations used to protect the resources are discussed under each alternative.

15.52 NEPA directs Federal agencies to develop and analyze a range of alternatives to a proposed action that covers various uses of available resources. The varying categorization of resources under the different alternatives noted reflects the alternative levels of development and resource protection or use.

The specific alternatives and categories range from maximum development and minimal resource protection to maximum resource

protection with a minimum of development; hence, the differing acreage figures in category 2 from one alternative to another.

The Price River Resource Area (Moab District) considered that the stipulation for the Sunnyside Water Supply (No. 110) would be more stringent than the groundwater protection stipulation for Areas 116, 119, 120, 121, and 123.

15.53 General stipulations which apply to all CHLs would protect soil and water resources in this case. See Volume II, Appendix 1, Surface Disturbance Stipulations for CHLs and Public Water Reserve 107 and Legal Water Source Stipulations sections.

15.54 Present information indicates that only minimal, if any, subsidence would take place as a result of in-situ tar sand development in any of the STSAs. To date, no conversion applications have been received for the White Canyon STSA, and its commercial value is estimated to be low. If this STSA were developed, in-situ methods would probably be used because of the thickness of overburden. Any surface disturbance that did result from development could, however, take place anywhere in the STSA, subject to the leasing scenario and stipulations selected. That portion of the Short Canyon area lying within the White Canyon STSA could sustain substantial surface disturbance from tar sand development.

15.55 Tar sand in the Circle Cliffs STSA is generally deep enough so that underground mining or in-situ development is feasible for the majority of the deposit.

15.56 The text in Volume II, page 105 of the Draft EIS is correct. For analysis purposes, all BLM lands in the STSA, including the two areas mentioned in the comment, would be category 1 under Alternative 2. The footnote on the map (page 106 of the Draft EIS) was to convey this intention. The maps have been corrected in the Final EIS. The entire area would be managed in category 1 in Alternative 2, thus presenting "an all development" alternative.

Note that the correct title of the first area is the Wolverine Petrified Wood Recreation and Scientific Preservation Area, as stated in the Federal Register of October 15, 1982.

15.57 Refer to Letter Response 15.53. After analysis of plans of operations, additional data on aquifers may be required on a site-specific basis.

15.58 The observation is correct. Special stipulations designed to mitigate adverse impacts may be applied to all those resources (no matter how many) that warrant protection.

15.59 At the present time, existing categories have not been changed from those selected in the BLM's planning process; thus, no resource protection has been removed from any portion of the Pariette tracts. The alternatives discussed in Volumes II and III are based on different levels of hydrocarbon development and resource protection. For the Pariette STSA, four alternatives are discussed, along with the stipulations which could be used to protect certain resources.

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The conventional oil and gas potential is not expected to be impacted by tar sand development. Refer to Volume I, pages 49-50 of the Draft EIS for an evaluation of tar sand deposits in the Pariette STSA.

15.60 No actions proposed in this STSA would affect National Forest lands. All proposed actions are restricted to the 12,877 acres of public land administered by the BLM. Volume II contains proposed planning amendments to update BLM's land use plans. These amendments will have no effect on the Forest Service planning effort (and vice versa). See the Forest Service Comment Letter 34.11 for information regarding planning status for National Forest lands within the Argyle Canyon/Willow Creek STSA.

15.61 Refer to Letter Response 15.51. The information regarding oil and gas on the Argyle Canyon/Willow Creek STSA, while not mapped, appears in Volume I, page 46 of the Draft EIS.

15.62 Refer to Letter Response 15.53. Also, refer to Volume II, Chapter 2, Argyle Canyon/Willow Creek STSA, Alternatives section. Alternatives 2 and 3 have special stipulations to protect the soil resource.

15.63 The drainage channel in the area you refer to is not managed by BLM; therefore, no stipulations for hydrologic protection were applied. For information regarding protection of springs, refer to Volume II, Appendix 1, Public Water Reserve 107 and Legal Water Source Stipulations section.

15.64 The acreage figures shown in Volume II, Table 1-4 have been changed in this Final EIS to accurately reflect the description of the alternatives in Chapter 2.

15.65 Volume I, Table 3-6 contains a summary made from available groundwater data of the 11 STSAs; groundwater discussions are found for the STSAs in Volume II. Considerable data are available and are considered adequate for the purpose of this Regional EIS.

Tar sand deposits occur at a depth of 300 feet in the Pariette STSA with little or no major water aquifers above 600 feet (Hubbard, 1984). Pariette Draw water apparently comes from a perched water table recharged from surface irrigation water. Tar sand production is not projected for the Pariette STSA.

15.66 The areas adjacent to the Reservation are private, State, and National Forest lands; consequently, land use plans for these areas are not being amended by this document. Considerable hydrological data are available for the 11 STSAs, which has been summarized in this EIS. For further information, see the report entitled Potential Hydrologic Impacts of a Tar Sand Industry in 11 Special Tar Sand Areas in Eastern Utah (USDI, GS, 1983).

For stipulations on erosion control, refer to Letter Responses 7.1 and 15.53.

15.67 For stipulations concerning erosion control, refer to Letter Responses 7.1 and 15.53. Should evaluations of plans of operations for site-specific development show the need to control erosion, additional mitigation or special stipulations would be required.

15.68 For a discussion on adequacy of data, refer to Letter Responses 15.65 and 15.66. The EIS is not intended for encyclopedic descriptions, but rather to summarize and briefly describe the affected environments and expected impacts to them. The White Canyon STSA is such an example, as no hydrologic impacts are expected. Plans of operations from interested companies would require an EA or EIS on a site-specific basis, where appropriate; contact would then be made with others who are affected and/or interested, such as the the Ute Tribe.

15.69 Because only oil and gas are planned for development in the Pariette STSA, tar sand development is not analyzed for this STSA. For information regarding oil and gas categories and analysis, refer to the Districtwide EA for Oil and Gas Leasing prepared by the BLM, Cedar City District Office.

15.70 An error was discovered in the leasing categories for the Multiple Use Alternative in Volume III, Table 2-1 of the Draft EIS. This has been corrected in Volume III of this Final EIS.

15.71 The actions which would affect the Sunnyside and Vicinity STSA (Southern Portion) can be correlated with the actions that would affect the lease tracts within this STSA by comparing like alternatives in Volumes II and III.

a. Figure 1-1 in Volume III shows the locations of the lease tracts within the STSA.

b. Figure 2-9 in Volume II shows the locations of areas in categories 1, 2, 3, and 4 under the Multiple Use Alternative.

c. Compare Table 2-1 in Volume III, "Multiple Use Preferred" column, with the description of the Multiple Use Preferred Alternative in Volume III.

In response to your comment, the chart on the following page has been constructed specifically to clarify the impacts to watersheds, springs, aquifers, etc., as indicated in Volumes II and III.

The chart shows that 2,324 acres of the total 10,683 acres of watershed area would occur in the potential lease tracts and would be protected by special stipulations.

The comment also raises the concern that the alternatives in Volume III pertaining to Sunnyside tract 7 presume a decision in Volume II. The primary focus of Volume III is to assess the differences in impacts from varying the amount of new leases made available. Any new leasing would have to be in accordance with future decisions resulting from Volume II. Volume III did attempt to demonstrate the effect of some of the alternatives from Volume II on the leasing alternatives in Volume III. However, for considerations of space, not all permutations of the alternatives were displayed in Volume III.

Area	Areas Under Proposed Watershed Stipulation Within STSA[a]	Areas Under Watershed Stipulation Within Potential Lease Tracts[a]		Percent of Area Within Potential Lease Tracts
No. 110, Sunnyside Water Supply Reserve	2,400	SS[c] Tract 7	640	27
No. 111, Public Water Reserves/Riparian Areas	3,615	SS Tract 2	360	10
No. 113, Bear and Rock Creek Watershed	1,960	None	None	0
No. 116, Range Creek Watershed	1,442	SS Tract 8	1,324	93
No. 118, Jack Creek Watershed	1,266	None	None	0
Total	10,683		2,324	

[a]Refer to Volume II, Chapter 2, Multiple Use, Preferred Alternative.

[b]Refer to Volume III, Chapter 4, Multiple Use, Preferred Alternative.

[c]Sunnyside and Vicinity STSA.

15.72 Refer to Letter Response 15.71. Volumes II and III do correlate between like alternatives. Note that Volume 1 analyzes two levels of tar sand production. Volume II analyzes how alternative leasing categories and protections afforded under special stipulations would protect certain resources. Regardless of the level or intensity of production, the categories and stipulations analyzed in Volume II would still apply. Management under an alternative selected from Volume II could be constraining on the level of tar sand production. The competitive leasing levels discussed in Volume III are considered a part of the overall production levels analyzed in Volume I.

The independent operation of Sunnyside tract 1 and combination of tracts 2 through 9 are logical assumptions, based on tract size and quantity and availability of the tar sand resource. Estimated water consumption and acres of surface disturbance for development of tract 1 and tracts 2 through 9 are additive. Development of all tracts would not increase the sum total or rate of acre-feet of water consumed or acres of surface disturbed.

15.73 Refer to Letter Response 15.28.

Comment Letter 16

WILLIAM BELKNAP, JR.
P. O. BOX 365
BOULDER CITY, NEVADA 89005

16 January 1984

State Director
Bureau of Land Management
Utah State Office
University Club Bldg.
136 East South Temple
Salt Lake City UT 84111

Dear Sir:

This letter is to comment on the Utah Combined Hydrocarbon Regional Draft EIS. My comments apply only to the Sunnyside Special Tar Sand Area.

I would urge that the BLM adopt Alternative #3 -- "No Action" -- as set forth in Volume I of the Combined EIS, as it applies to the Sunnyside Area. The special scenic, wildlife habitat, and recreational values of this area make it imperative that no strip mining of the type that would be required for the removal of the tar sands should ever be allowed. Conversions of oil and gas leases to combined hydrocarbon leases should not be allowed.

Sincerely,

Bill Belknap

Bill Belknap

53

Comment Letter 17

UTAH NATIVE PLANT SOCIETY

Reply to: P. O. Box 1555
SLC UT 84110

January 16, 1984

State Director
Bureau of Land Management
Persemon 56 E. So. Temple
utahensis Salt Lake City, Utah 84111

Re: Utah Combined Hydrocarbon
Regional Draft EIS

Sir:

In response to the above-referenced draft EIS, the following comments are submitted:

Volume I

17.1 Pages 5, 8, 30 & 135 (etc.): A preferred alternative would be one that did not involve losses to individuals, populations or habitat of Sclerocactus wrightiae in the San Rafael Swell STSA. The populations of this species that are targeted for recovery (in accordance with the draft FEWS recovery plan for this species) should not be disturbed. Elimination of cryptogamic crusts in the disturbed areas would probably preclude this species from growing in those areas.

17.2 Pages 53 & 54: The inclusion of the table found on page 54 is appreciated; however, there is no coordination between the statement referring to Table 3-11 on page 53 and pages 94 and 222 thru 227 (Appendix 4). Page 53 indicates that Table 3-11 contains all available information on the occurrence of threatened, endangered and sensitive plant species in each STSA yet the FEWS's 6-13-83 letter contains various plant species not indicated in Table 3-11 for every STSA except Hill Creek. How was the determination made to drop the various species listed in the FEWS's letter? A reconciliation is needed.

17.3 Additionally, in Table 3-11 a footnote to the Hill Creek STSA indicates the clearances will be required for threatened and endangered species; does this mean that clearances won't be required for the other STSA's? (The words "sensitive species" need to be added to the clearance requirement.)

17.4 Pages 110 & 150: Research has shown that native seed mixtures, alone or in combination with non-native seed, can be successfully used and reclamation goals met. Seed of native species should be included in any revegetation effort and where mixtures containing exotic species must be used, the exotic species should be species that are short lived and that will not exclude the re-entry of native vegetation (e.g. crested wheatgrass excludes or tends to exclude other species).

CONSULTATION AND COORDINATION

Comment Letter 17

Volume II

Pages 7 and 25: The preferred alternative is supported with respect to the habitat protection of the listed Sclerocactus glaucus.

17.5 Pages 39 (Table 1-5), 43, 154 & 175: The portion of the similar statements found on these pages indicating that populations of S. glaucus could be relocated should be deleted from the EIS. Transplantation is not a commonly accepted procedure for offsetting impacts. It is not an alternative to avoiding the populations as these statements seem to suggest. Transplantation studies are being conducted in Colorado for this species but it will be a very long time before anything definitive will result.

17.6 Page 55: Since "sensitive" species aren't listed in the usual sense, it is suggested that the words "are considered to be" are inserted between "or" and "sensitive" on line 7 of column 1. (Typographical erros in species' names also need correction.)

17.7 Pages 63, 154 & 175: These pages incorrectly refer to the federal law protecting threatened and endangered plant and animal species. The incorrect variations should be replaced with "Endangered Species Act of 1973 (as amended)."

Volume III

17.8 Page 34: Change "wrightii" to "wrightiae."

17.9 Page 56: It is not clear how BLM policy would help to mitigate the direct loss of habitat for Cryptantha ionesiana under this alternative. The alternatives avoiding impacts to habitat of this species and to habitat of Astragalus nidularis are supported.

. . .

17.10 We are concerned about the use of terminology in the EIS concerning threatened, endangered & sensitive species. The glossary provided with each volume appears to fairly well define these terms but they are not used consistently in the text. When it it stated, for instance, that no impacts to threatened and endangered species will occur, it is assumed that this means there will be no impact to neither federally listed species nor sensitive species but this is not always clear. For clarity, it may be advisable to refer to threatened and endangered species in general as "species federally listed as threatened or endangered and species considered to be sensitive" since two overall categories of "TAE" species are involved:

1. Species listed under the ESA (listed as endangered, threatened or similar in appearance to a listed species)
2. Species considered sensitive including:
   (a) Candidate species or species under review for listing (FWS category 1 & 2 species)
   (b) Other species (certain FWS category 3 species, species that are rare and could become candidate species, species that are rare or unique in a particular region and any other species requiring special management attention.

Thank you for the opportunity to comment.

Very truly yours,

UTAH NATIVE PLANT SOCIETY

Anthony J. Frates
Conservation Committee

17.1 Although Sclerocactus wrightiae does occur within the San Rafael Swell STSA, populations of this plant targeted for recovery do not. Nevertheless, should BLM find that this endangered species may be affected, official consultation will be initiated with FWS under Section 7 of the Endangered Species Act (refer to Volume I, page 94 of the Draft EIS). However, as stated in Volume I, Chapter 4, Environmental Consequences section, a site-specific analysis cannot yet be made. Therefore, threats to this species within the STSA have not yet been identified.

17.2 Volume I, Table 3-11 (page 54 of the Draft EIS) shows threatened, endangered, or sensitive plant species known to occur within certain STSAs. Their occurrence within these STSAs has been documented by surveys, literature searches, and herbarium records. Volume I, Appendix 4 is a statewide list of threatened, endangered, and sensitive species that may occur in the general area of STSAs. Table 3-11 shows species that are known to occur within certain STSAs, and Appendix 4 shows species that "are in the concerned area" and is a general list for species which may or may not occur within certain STSAs.

17.3 Volume I, Table 3-11 has been changed in this Final EIS as follows: The superscript "a" was moved from Hill Creek to the Threatened, Endangered, and Sensitive Species column heading. The words "and sensitive" were added to the footnote.

17.4 The information will be considered in reclamation of disturbed sites. Note that these sections do not recommend the use of seed mixtures composed, all or in part, of introduced plant species. The ideal situation would be to revegetate reclaimed areas entirely with native plant species, which would occur naturally on the site under good ecological site conditions. However, the EIS points out and documents that disturbed sites can sometimes be revegetated more surely and quickly using introduced plant species. Speedy revegetation is of high importance when conservation of soils and protection of watershed are primary issues.

17.5 The statements indicating that populations of Sclerocactus glaucus would be relocated have been deleted in Volume II of this Final EIS. These sections now read: "If the Uinta Basin hookless cactus were found on any site proposed for disturbance, consultation with the FWS would be necessary prior to hydrocarbon development."

17.6 These corrections have been made in Volume II of this Final EIS.

17.7 This error has been corrected in Volume II of this Final EIS.

17.8 This error has been corrected in Volume III of this Final EIS.

17.9 BLM policy would help mitigate direct loss of habitat by requiring the following steps:

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a. An on-the-ground survey of the area(s) on which the surface is to be disturbed would be conducted.

b. A delineation of the occurrence of individuals and habitat (of sensitive species) within the surveyed area would be made.

c. A determination as to whether the sensitive species would be adversely affected would be made.

d. Alternatives to reduce or eliminate impacts would be explored.

e. If adverse impacts could not be eliminated or significantly reduced, mitigating measures would be employed. This could include substantial adjustments in the proposed action.

Beyond this, the specifics of any required mitigating measures can only be outlined after the final plan of operations is submitted and the situation evaluated.

17.10 When the term "threatened and endangered species" is used, the word "sensitive" is intentionally left out of Volume II of this EIS. Sensitive species are discussed in Volume I. Inventory data on sensitive species within the STSAs are extremely limited, and their value is inconsistent between STSAs. As on-the-ground inventories are conducted and sensitive species are encountered, site-specific mitigation may be designed, based on the circumstances. It is BLM's policy (IM No. 79-64) to manage sensitive species as if they were threatened or endangered even though these species are not covered by law. Also, see the Glossary for a definition of "sensitive species."

Comment Letter 18

Standard Oil Company (Indiana)
200 East Randolph Drive
Post Office Box 5970A
Chicago, Illinois 60680
312-856-5548

D.W. Robinson
Manager, Synthetic Fuel Programs

January 17, 1984

Mr. Roland G. Robison - State Director
Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr. Robison:

Attached are Standard Oil (Indiana)/Amoco Production Company's comments on the Utah Combined Hydrocarbon Regional draft Environmental Impact Statement. We have also prefaced the detailed list of comments with a general statement about the possible impact of the document on future tar sands development.

Sincerely,

D. W. Robinson

Attachments

Comment Letter 18

STANDARD OIL COMPANY (INDIANA)/AMOCO PRODUCTION COMPANY
COMMENTS ON UTAH COMBINED HYDROCARBON LEASING DRAFT EIS

General

18.1 The draft EIS, in general, does not provide a balanced analysis of the benefits and impacts of tar sands development. Major emphasis is placed on the adverse effects of development and little attempt is made to balance these impacts with the benefits which will accrue from development. Moreover, the analysis ascribes a higher than justified level of certainty to impacts. This treatment effectively excludes development of innovative mitigation strategies which can be defined as knowledge of the resource and extraction technologies develops. The high level of uncertainty which relates to many of the impacts discussed, and the early stages of development of the tar sands industry, mandates a more flexible approach which will provide both reasonable protection of the environment and resource development.

18.2 The High Production Alternative includes unsupportable projections of development from the Sunnyside STSA. These projections result in an overstatement of impacts and a bias against development. Moreover, the worst case analysis methodology appears to be at variance with proposed guidelines issued by the CEQ in August 1983 which would require a probabilistic approach. Selection of the worst case alternative regardless of the probability of its occurrence appears to be unjustified in any event.

STANDARD OIL (INDIANA)/AMOCO PRODUCTION COMPANY
COMMENTS ON UTAH COMBINED HYDROCARBON REGIONAL DRAFT EIS

Volume I: Regional Analyses

	Page	Column	Para.	
18.3	2	2	1	Summary, No Action--The No Action alternative is unsupportable and does not provide for a reasonable balance between resource development and protection of the environment. Accordingly, this alternative should be rejected.
18.4	2	2	3	Summary Alternative 1: High Commercial Production--As a result of our review of the Air Quality Technical Report (Aerocomp, 1983) which contains the basis for the predictions regarding excursions of NAAQS and PSD increments, we feel that these predictions are based on improper modeling techniques and inaccurate emission inventories. Consequently, the projections made are pure speculation.
18.5				It is stated in this section, that the NO_x NAAQS will be violated. There is an NO_2 NAAQS, but no standard for NO_x (NO_x implies NO + NO_2).
18.6				One major point which is missed in this section is that existing environmental regulations would not

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	Page	Column	Para.	
18.6 cont.				allow air quality to degrade to the levels predicted as a result of this study.
	5	2	3	Alternative 2: Low Commercial Production--See above comments pertaining to degradation of Air Quality.
18.7	14	1	2	Post-EIS Planning and Leasing Process--The projected date of May, 1984, for the initial lease tract sale appears to be overly optimistic. No urgent development requirement dictates such an early date. Reference to such a schedule can result in inadequate land use planning and analysis and leasing decisions. Adequate time should be provided to fully and adequately address all pertinent issues and develop supportable leasing programs.
18.8	22	All		Alternative 1: High Commercial Production (Table 2-2)--The Sunnyside production estimate is unsupportable. Assumes production from surface mining projects is additive. This is erroneous. Some of the surface mining project plans of operations envision some degree of unitized or cooperative development of the Sunnyside resource.

	Page	Column	Para.	
18.8 cont.				Accordingly, the production of the individual developers are not fully additive. This erroneous analysis results in an overstatement of the impacts of development of the Sunnyside resource, e.g., water requirements, air pollution, socioeconomic, water quality, etc.
18.9				Moreover, neither Alternative 1 or 2 provides adequate analysis of the benefits of development or attempts to compare on a systematic basis the benefits against the impacts of development.
18.8 cont.	15	1	1	Introduction--For the reasons cited above, the Alternative 1 production projections for Sunnyside are not in the realm of possibility, contrary to the assertions made in the Introduction.
18.10	34	All		Table 3-1, Ambient Air Quality Within STSA's--In the context of this table, Footnote C does not apply "standards given in $\mu g/m^3$." What would be more applicable would be a footnote explaining what the range of numbers in the table mean, since this is unclear. It should be stated if the annual TSP concentrations are an annual or geometric mean. Footnote d, "standards not

	Page	Column	Para.	
18.10 cont.				established" for CO for the Colorado River Airshed is not true.
18.11	35	All		Table 3, Utah, Colorado, and National Ambient Air Quality Standards--The total suspended particulates (TSP) standard is expressed as an annual geometric mean. The SO_2 and NO_2 annual standards are expressed as an arithmetic mean. This table needs to state that the annual TSP standard is an annual geometric mean. The 160 $\mu g/m^3$ hydrocarbon standard has been rescinded by the EPA.
18.12	51	1	5	Other Minerals--This paragraph does not identify the potential for coal mining, or the method by which coal would be mined. Such a discussion would be helpful for proper analysis.
18.13	61	2	6	Sunnyside STSA--This paragraph implies that Bruin Pt. is federally-owned. Most of Bruin Pt. is privately owned. This situation should be properly presented to prevent misinterpretation by readers.

	Page	Column	Para.	
18.14	67	1	5	Sunnyside STSA--There appears to be no basis to "reasonably expect" to find Fremont and Anasazi cultural sites in the Sunnyside STSA, based on other sites elsewhere. The level of uncertainty should be properly characterized.
18.15	93	2	2	Analyses, Assumptions, and Guidelines--Assumption No. 5--Use of worst-case analysis appears to be at variance with CEQ proposed guidelines of August, 1983, which specifies that worst case analysis must represent reasonable, likely conditions. To assume the worst case, when two or more outcomes are possible in all cases appears to be unsupportable and can result in the elevation of extremely remote occurrences to higher than expected outcomes. The probabilistic nature of an outcome should be considered in the analysis, and the level of uncertainty attached to assumptions should be stated to convey the level of confidence attached to projections.
18.16	95	All		Table 4-1, Alternative 1: Air Quality Impacts Within STSA's--Because of the flawed analysis (per our review comments of the Air Quality Technical Report) techniques, these projected exceedances

	Page	Column	Para.	
18.16 cont.				are pure speculation. However, existing environmental regulations would ensure that development does not degrade air quality to the levels projected.
18.17	97	All		Table 4-2, Alternative 1: Comparison of Maximum Increased Pollutant Concentrations with PSD Increment Limitations--We believe that the analysis techniques used to estimate these numbers are flawed (per our review of the Air Quality Technical Report); hence, these are not a realistic representation of air quality after development of the resource.
18.18	102	1	1	Since the air quality data presented in the Regional EIS has been extracted from the Air Quality Technical Report for the Sunnyside Combined Hydrocarbon Lease Conversion, prepared by Aerocomp, we have also reviewed that document. As a result of this review, we feel that the conclusions reached in the Aerocomp Technical Report are erroneous because of flawed or inappropriate air quality analysis techniques and totally inaccurate emission inventory data. Since this technical report is the basis for the

	Page	Column	Para.	
18.18 cont.				Sunnyside air quality data presented in the Regional EIS, we feel it is of value to provide our comments on the technical report, as well as the Regional EIS.

THE COMMENTS ON THE AIR QUALITY TECHNICAL REPORT FOR THE SUNNY-SIDE COMBINED HYDROCARBON LEASE CONVERSION EIS ARE NOT INCLUDED IN THIS REGIONAL EIS.

18.19	102	1	2	Air Quality--We concur that the purpose of this report is to satisfy the NEPA requirements and not to satisfy the regulatory permitting procedures under the CAA, however, we feel that the BLM cannot ignore the fact that permitting regulations would not allow the resource development to exceed the NAAQS and PSD increments. Because the accuracy of the projections are very poor (per our review of the Air Quality Technical Report), the conclusions regarding compliance with NAAQS and PSD increments are premature.
18.20	103	2	7	There is no evidence to date suggesting that tar sands processing waste sands will contain any toxic or carcinogenic substances. Amoco's testing of solvent extraction process waste sands shows

	Page	Column	Para.	
18.20 cont.				that the sands do not meet any of the U.S. EPA hazardous waste characteristics. Also, preliminary acute toxicity testing of solvent extracted bitumen have indicated no systemic toxicity. Additional testing and evaluation is planned. Under no circumstances would Amoco knowingly allow actual or suspected toxic or carcinogenic substances to escape into the environment. Statements to the effect that toxic or carcinogenic substances could enter into streams from waste disposal areas should not be made without supporting evidence or documentation.
18.21	102 & 103		All	Why is it necessary to have lead-off paragraphs for the Total Suspended Particulates, Sulfur Dioxide, Nitrogen Dioxide, Ozone, and Carbon Monoxide sections detailing the most adverse environmental and health effects of large concentrations of these pollutants when such concentrations would not occur from tar sands development? This is a particularly questionable practice in the Carbon Monoxide section where predicted concentrations are so low that they aren't even given in the DEIS (Vol. 1, Tables 4-1 through 4-3). Even so, the DEIS lists symptoms

	Page	Column	Para.	
18.21 cont.				ranging from vision impairment to death for carbon monoxide.
18.22	105	1	5	The necessary holding pond capacity is determined by a variety of site-specific factors. A 24-hour, 100-year storm event capacity appears excess, and the surface area required may not be commensurate with the amount of protection afforded by the pond.
18.23	111	1	1 & 2	Terrestrial Animals, Big Game--The impacts of development on mule deer and elk populations projected under the grossly overstated Alternative 1 are so small (four, seven, and ten percent) as to be insignificant.
18.24	137	2	6	It is generally assumed that vegetation would become reestablished within two to five years on reclaimed land. Most of the disturbed land will be used for surface mining and would be reclaimed as contemporaneously as possible. It would not, therefore, be without vegetation for life of project plus five years. Throughout the life of project, various sections of land would be in various stages of disturbances and reclamation as well as large sections remaining undisturbed.

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18.25	138	1	3	The UDWR estimates that deer herd 27B's overall summer and winter habitats are about 266,944 acres and 628,324 acres, respectively. The Range Creek elk herd has about 80,640 acres and 199,296 acres of overall summer and winter habitat, respectively. Deer and elk summer habitat in the STSA totals about 88,926 acres and 62,956 acres, respectively. The use of 7,500 acres of deer summer habitat would mean a disturbance of eight percent in the STSA and three percent overall. For elk, the use of 7,500 acres would disturb about 12 percent of elk summer habitat in the STSA and about four percent overall. Overall winter habitat disturbed for deer and elk would be about one and four percent, respectively. These percentages of disturbed habitat are far below those of 24 and 52 percent as reported in the DEIS.
8.23	138	1	4-5	Presumably sage grouse habitat, particularly strutting grounds and nesting areas as well as Golden Eagle nest sites, would be protected by BLM leasing stipulations, and their loss should not be assumed by this DEIS.

	Page	Column	Para.	
18.27	138	2	2	Water withdrawals for Sunnyside tar sands development as analyzed by the site-specific DEIS would result in a 22 percent reduction in Price River flows and less than one percent reduction in Green River flows. While it is possible that the Price River flow reductions may affect aquatic habitat, it is doubtful that the Green River aquatic habitat would be adversely affected by flow reduction. Mandatory environmental controls on water withdrawal systems and existing water quality controls for discharges would protect aquatic organisms and existing water quality. Within the STSA, it is possible that sections of streams may be adversely affected but not to the extent implied in this section.
18.28	139	1	1	For the worst case, loss of 625 AUM's means that 156 cows would not be able to use the STSA for the four month grazing season. This impact could easily be mitigated and existing allotment operators would not suffer a loss in revenue.
18.29	136	2	1	Sunnyside STSA--As stated earlier, a production level of 125,000 BPD is considered unrealistic for Sunnyside. Accordingly, the impacts discussed in

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	Page	Column	Para.	
18.29 cont.				this section are overstated and should be revised to represent more realistic values.
18.30	138	1	3	Terrestrial Wildlife--Impacts are even though likely overstated, since they are based on the erroneous assumptions of production, the impacts of development on deer and elk populations projected appear to be not significant.
18.31	142	1	2	Alternative Low Commercial Production Air Quality--As previously stated, the air quality analyses conducted for Sunnyside produced results which are purely speculative. Hence, it cannot be stated with any certainty that excursions of NAAQS or PSD increments will occur.
18.32	142	1	6	SO_2 is not a pungent gas at concentrations below the three-hour secondary NAAQS of 1,300 $\mu g/m^3$ (which is the odor threshold). Toxic SO_2 concentrations are in the range of 500-1,000 ppm. These concentrations are well above projected ambient levels. Language classifying SO_2 as a toxic pungent gas should be deleted from this discussion.

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18.33	204		D1a	Appendix 1--As stated previously, the High Commercial Production scenario is considered to be unsupportable.
18.34	211	1	4	Guideline 3--This guideline appears to imply that the existence of values such as scenic qualities, wildlife habitat, scientific, educational, historical, ecological, or geological values will be sufficient to justify placing an area in a more restrictive development category. This appears to be at variance with the multiple use criterion and does not provide for the balancing of benefits with impacts. This apparent inconsistency should be clarified and made consistent with the concept of balanced, multiple use.
18.35	213 214 215	2 All	4 1-14	Special Tar Sand Guidelines--Special Stipulation 7 appears to apply only to oil and gas wells. To be applicable to tar sands provision must be made for surface mining and development.
18.36	213	1	3	Category 3--This guideline would seem to imply that a Category 3 designation would automatically revert to Category 4. This assumption appears to be premature based on the state of technology development and the uncertainty of resource value.

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18.37	214	2		Stipulation 13--Provision should be made in this stipulation for surface mining to be applicable to tar sands development.
18.38	230	All		Appendix, Table 5-1, NAAQS for National Levels and Colorado and Utah--The total suspended particulates (TSP) standard is expressed as an annual geometric mean. The SO_2 and NO_2 annual standards are expressed as an arithmetic mean. This table needs to state that the annual TSP standard is an annual geometric mean. The 160 $\mu g/m^3$ hydrocarbon standard has been rescinded by the EPA. The standards are also expressed as $\mu g/m^3$, not mg/m^3.
18.39	Appendix 5			Air Quality Impact Significance Criteria and Analysis Methodology--Amoco has commented extensively on the Air Quality Technical Report and on the analysis techniques used in the preparation of this DEIS. These comments also apply to Appendix 5.

STANDARD OIL (INDIANA)/AMOCO PRODUCTION COMPANY

COMMENTS ON UTAH COMBINED HYDROCARBON REGIONAL

DRAFT EIS

Volume II: Leasing Category Amendments

	Page	Column	Para.	
18.40	2	1	5	Major Issues--Language defining major issues is considered unnecessarily vague and provocative. Terms such as "loss" of important wildlife habitat, "loss" of existing pipelines and microwave sites, and "loss" of forage and vegetation for livestock and wildlife are incorrect and tend to be pejorative. Impacts on these values or resources is projected to be substantially less severe than characterized even under the most severe alternative. Moreover, impacts vary over the scenario considered. No indication is provided of this variability or the uncertainties attached to the projections. Moreover, no indication of the mitigability of these impacts is provided. For example, microwave sites and pipelines could be relocated if

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18.40 cont.				necessary and would not be "lost." Moreover, no indication of the benefits associated with development is provided in this discussion, resulting in unjustifiable bias against development.
18.41	2	2	4	Sunnyside and Vicinity (STSA Southern Portion) Environmental Consequences--We believe that development of this resource as assumed would not result in serious air quality degradation. Current environmental regulations will not allow this to occur. Differentiation between air quality effects for the alternatives considered is not possible because of the inaccuracies in the air quality analyses (per our review of the Air Quality Technical Report).
18.42	2 2 3	1 2 1	1-4 4 1-3	Summary, Environmental Consequences--The basis for the impacts described in this section is not defined. However, it is assumed, based on the discussion in Vol. 1 that a worst case analysis is employed, i.e., maximum production and most degrading mining method. As stated earlier, it is considered that this worst case analysis methodology is unjustified and at variance with

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18.42 cont.				the position of CEQ. Moreover, the maximum production scenario overstates production and related impacts. In addition, the language employed in the discussion implies complete loss of values, such as critical habitats and recreational values. No such losses are likely to occur in any development alternative. Further, virtually no attempt is made to define the benefits accruing from development. Accordingly, the discussion is incorrect with regard to its statement of impacts and therefore biased with regard to its implications. Such treatment distorts the issues involved and can mislead the public and decision makers.
18.43	31	All		Table 1-5--The preferred alternative should be Alternative 1 (No Action/Development). The environmental protection given to areas within the STSA by Alternatives 2 and 3 (Multiple Use) could also be given to those same areas by Alternative 1 under existing environmental regulations and reviews and leasing stipulations. This viewpoint also is shared by the BLM as stated on page 85, first column, last paragraph of this report. Instead of excluding areas from surface occupancy,

	Page	Column	Para.	
18.43 cont.				full use, or development, the BLM only should identify those areas as being worthy of special protective measures. Such measures would have to be incorporated into Plans of Operation. If after reviewing proposed plans, the BLM feels that environmental protection and/or mitigation objectives could not be adequately met by a plan or modifications thereof, then development activities in all or parts of these areas could be suitably controlled by lease stipulations. Alternative 4 (Restricted Development) precludes surface mining which is the only method for recovering most of the resource in the STSA, and therefore, this alternative is not responsive to the implementation of the Combined Hydrocarbon Leasing Act and should be eliminated from consideration.
18.44	66	1	6	We question whether this number of motorists traveling surrounding highways can view the STSA. At most, many fewer than the stated 766,500 motorists can see only a very small portion of the potentially affected Roan Cliffs section of the STSA. This number used appears to be highly inflated and should be qualified or reduced.

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18.45	66	2	8	We agree that tar sand development could proceed with adequate environmental mitigation given to all areas in the STSA. This protection could achieve the same results as Alternatives 2 and 3.
18.46	68	1	1	The upper reaches of Range Creek contribute only a very small amount of water to the total flow through this drainage. Instead of Category 4, these two areas should be classified as Category 2 as was done under Alternative 3. The Category 2 stipulations given in Alternative 3 would give adequate protection to downstream water uses. The Category 2 stipulations should be further modified to allow discharges. Water discharges after suitable treatment, if necessary, should be allowed.
18.47	68	2	1	The Sunnyside Water Supply Reserve should be given Category 2 status for the reasons stated above.
18.48	68	2	2	Category 2 status instead of Category 3 status should be given to the Cottonwood and Dry Creek Canyon area designated as Area No. 111. A prospective developer should be given the opportunity to propose uses for these areas which

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18.48 cont.				may be compatible, with adequate environmental protection and mitigation, to downstream water uses. Also, these areas constitute only a very small percentage of the total drainage to Nine Mile Canyon and the Green River. The use of part of the upper Dry Creek and Cottonwood drainages would not have a detectable effect on water flows in Nine Mile Creek. Also, downstream water quality would be protected by suitable treatment, if necessary, of discharged water.
18.49	68	2	5	Area No. 113 (Bear and Rock Creek Watersheds) should be changed from Category 3 to Category 2. Only the most upper reaches of these watersheds are within the STSA and could accommodate limited surface occupancy with adequate downstream environmental protection and/or mitigation.
18.50	70	1	1	In-situ and mining methods should not be categorically excluded from Area No. 116 (Range Creek Watershed). Instead, specific activities or uses proposed for this area should be evaluated on a case-by-case basis. Until specific proposals are evaluated, it is not at all certain that in-situ production and mining activities in this

	Page	Column	Para.	
18.50 cont.				areas are incompatible with environmental protection.
	70	1	3	Same comment as above.
18.51	70	2	1-6	In-situ or mining activities should not be categorically denied in the Roan Cliffs area (Area No. 120) and in the deer and elk summer and winter ranges (Area Nos. 121 and 123). Clearly, with adequate environmental controls, these activities could occur in a large part or all of these areas without totally preempting their visual and wildlife resources. Prospective developers should be given the opportunity to propose reasonable environmental protection and mitigation plans upon which the BLM then could make decisions for full, partial, or no use for these land areas.
18.52	71	1	1	The limitations of 25 percent of any given lease area being disturbed at any one time should not be taken as an absolute restriction. Depending on depth of various tar sand zones, a larger area may be required for safe and efficient open pit mining of this resource. The 25 percent limitations should be used as a guideline to be applied whenever feasible on a case-by-case basis.

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18.53	71	1	3-4	The no-discharge stipulation is unwarranted and unreasonable. If deemed necessary, adequate treatment of water prior to discharge would maintain downstream water quality. Discharging would also maintain downstream water flows which would decrease significantly under a no-discharge restriction. Normal run-off and sediment control practices currently followed in the mining industry are adequate to safeguard downstream water quality and quantity.
18.54	71	1	5	Area No. 111 should be changed from Category 3 to Category 2. See previous comments for Dry and Cottonwood Canyon areas (p. 78, col. 2, para. 2).
18.55	71	2	6	What constitutes land disturbed by surface mining? Does the 25 percent disturbance limitation only apply to active mining operations or does it also include land being reclaimed? Also, the BLM should clearly define what is meant by 'completed' reclamation and 'revegetation substantially advanced'. Depending on the BLM's interpretation of these terms, this stipulation could cause inordinate delays in mining operations; delays whose costs may not be commensurate with the

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18.55				environmental protection afforded by this stipulation. The BLM should not place an overall arbitrary upper limits on land disturbances which may or may not accomplish the BLM's management goals.
18.58	73	1	1	The BLM should define what is meant by 'complete' hydrological testing and evaluation. In many areas of the STSA complete testing and evaluations may not be feasible and most likely unnecessary to predict impacts and develop suitable mitigation measures. The BLM should require not complete hydrological investigations but a level of investigations which would be adequate to reasonably describe base-line conditions, predict impacts, and formulate effective environmental protection and mitigation plans.
18.55 cont.	73	1	2	Same comment concerning 25 percent disturbance limitation as given for 71/2/6.
	73	1	4	Same as above.

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18.58 cont.	73	1	4	Same comment concerning 'complete' hydrological testing as given for 73/1/1.
18.57	73	2	2	Same comment concerning 25 percent disturbance limitation as given for 71/2/6.
18.58	73	2	4	Same comment concerning 'complete' hydrological testing as given for 73/1/1.
18.59	74	1	1	Same comment concerning 25 percent disturbance limitation as given for 71/2/6.
18.60	74	1	1	Off-site enhancement of similar habitat in exchange for disturbance in aspen communities should be a negotiable mitigation concept and not an absolute stipulation. Recognizing that aspen communities provide productive wildlife habitat, it does not follow that all aspen communities have equal wildlife value. Their usefulness to wildlife depends on such factors as adjacent habitat, size, and availability to name a few and off-site enhancement cannot be approached on a one-to-one basis. Also, the BLM needs to develop a framework of terms and conditions for off-site enhancement and take into account potential off-

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18.60				site enhancement areas and management responsibilities.
18.61	74	1	3	Same comment concerning 25 percent disturbance limitation as given for 71/2/6.
18.62	74	1	3	Same comment concerning 'complete' hydrological testing as given for 73/1/1.
18.63	74	1	3	Weather conditions would largely preclude any exploration, drilling, or surface development activities from November 1 to May 15. If any of these activities were attempted during the winter, they would be inherently hazardous to personnel and cause more environmental damage than when conducted during the normal summer work season. Without adequate exploration information, it would not be possible to develop Plans of Operation, and tar sand development would be eliminated from this area. Past exploratory operations during the summer season have caused little, if any, disturbances to deer and elk and have not been incompatible with wildlife use of this area.

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18.64	74	2	1	Surface mining is the only method for recovering most of the available tar sand resource in the STSA. By excluding surface mining, Alternative 4 precludes tar sand development in most of the STSA. For this reason, Alternative 4 is not a viable alternative for implementing the Combined Hydrocarbon Leasing Act in the Sunnyside STSA. It should be eliminated from consideration.
18.65	66-73 74	All 1	All	Chapter 2, Alternative Evaluations, Sunnyside and Vicinity STSA (Southern Portion)--An apparent inconsistency exists among Alternatives 1, 2, and 3 with regard to the treatment of the Sunnyside Water Supply Reserve. Leasing restrictions on areas affecting the water supply reserve are most restrictive in Alternative 1 which provides for maximum development. It is considered that Alternative 1 modified to provide for treatment of the Sunnyside Water Supply Reserve as specified in Alternative 3 provides for balanced, multiple use development with the standard oil and gas stipulations and other special stipulations proposed for wilderness, threatened and endangered species, and archaeological resources. This modified alternative should be designated the

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18.65 cont.				preferred alternative in lieu of Alternative 3 which is unnecessarily restrictive with regard to tar sands development.
18.66				Alternative 2 is inconsistent with Alternatives 1 and 3 in its treatment of the Sunnyside Water Supply Reserve. This alternative is less restrictive with regard to this reserve than Alternative 1, Maximum Production. Moreover, it does not appear that either Category 3 or 4 is justified for this reserve. Stipulation 110 for Alternative 3 is the only appropriate stipulation for this water reserve.
18.67				Stipulation 111 for Alternative 2 (and 3) appears to be unjustified. The impact of development on these areas is not established. Accordingly, establishment of restrictive provisions is not justified at this time. Alternatively, special stipulations requiring review of development plans and development of appropriate mitigation measures prior to development (if necessary) would be more appropriate.

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18.68				Stipulation 120 appears to be unjustified in consideration of the minimal impact surface mining in these areas affected would have on visual impact and winter habitats. Substantial tar sands resources will not be developed by these restrictions. The loss of tar sand resource will substantially outweigh the impact on visual and habitat areas.
18.69				Volume 1 specifies that the impact of development under the overstated maximum production alternative would be minimal. Accordingly, Stipulation 121 appears to be completely unjustified in consideration of the minimal impacts on summer range. Stipulation 123 is considered to be even less justified than Stipulation 121 in consideration of the more limiting impact of summer habitat.
18.70				Alternative 3, Multiple Use (Preferred Alternative)--The limitation of 25 percent disturbance of any given lease area at any time is completely unjustified and inconsistent with efficient resource development. Individual approval based on efficient resource recovery and

	Page	Column	Para.	
18.70 cont.				compatible, reasonable environmental protection should be criteria applied. As stated earlier, it is considered that this alternative should not be designated the preferred alternative because of its overly restrictive limitations on development. Stipulation 110 is considered to be acceptable. Stipulation 111 is opposed on the same basis as that stated for Alternative 2. The first provision of Stipulation 120 is opposed on the same basis as that stated for Alternative 2. The second provision of Stipulation 120 is opposed on the basis of its potential negative impact on efficient resource recovery. However, the provision for exceptions to this stipulation based on a demonstration of necessity for efficient resource recovery appears to be acceptable. The third provision of Stipulation 120 is opposed on the basis that is unsupported by fact. Development activity proposed should be subject to review and necessary mitigation measures imposed as appropriate. Provisions 1 and 2 of Stipulation 121 are considered to be acceptable. Provisions 3, 4, and 5 of Stipulation 121 are considered to be acceptable with the exception provisions specified. A more appropriate treatment of these

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18.70 cont.				issues, however, would not prejudge impacts but provide for analysis of proposed development at the time of application. Stipulation 123 is similarly not opposed based on the exception provisions provided. A more reasonable treatment would withhold judgment on restrictions, if any, at time development plans are submitted for review and approval by BLM. Alternative 4 is opposed as being unreasonable in that it does not provide a reasonable balance between resource development and environmental protection.
18.71	85	1	2	Public Attitudes--This section implies that local governments and citizens are opposed to further growth. This attitude has not been manifested in public meetings, and it is understood that local governments and citizens support development of tar sands resources.
18.72	90 90	1 2	6,7,8 1-3	Recreation--This discussion implies that Bruin Point is public land. Most of Bruin Point is privately owned and not subject to restrictions on use by BLM.

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18.73	179	2	6	Appendix 1, Stipulation 9--Seasonal restrictions on exploration and drilling should only be imposed where justified. Stipulation 13--Application of these restrictions should be limited only to those cases where specifically justified.

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COMMENTS ON UTAH COMBINED HYDROCARBON REGIONAL

DRAFT EIS

Volume III: Potential Lease Tract Analyses

	Page	Column	Para.	
18.74	8	1	4	Leasing Process--Competitive leasing by May, 1984, is considered unrealistic. Since there is no compelling need to lease additional tar sands on an urgent basis because of economic and other considerations, leasing should not be unnecessarily accelerated to meet arbitrary schedules.
18.75	23	2	2	Air Quality--It should be stated that for short-term PSD increments one excursion per year is allowed.
18.76	24	All		Table 3-1, Utah, Colorado, and NAAQS--The total suspended particulates (TSP) standard is an annual geometric mean. The SO_2 and NO_2 annual standards are expressed as an arithmetic mean.

	Page	Column	Para.	
18.76 cont.				This table needs to state that the annual TSP standard is an annual geometric mean. The 160 $\mu g/m^3$ hydrocarbon standard has been rescinded by the EPA.
18.77	25	All		First Table--It should be indicated what the range of concentrations listed in this table means. The data for CO are listed as being mg/m^3. These concentrations, however, are approaching the NAAQS for CO. The numbers probably reflect CO measurements which were made in $\mu g/m^3$, not mg/m^3. From this data, it is not possible to determine if the reported annual TSP concentration is an arithmetic or geometric mean. The footnote which indicates the standards are in $\mu g/m^3$ or mg/m^3 is irrelevant.
18.78	39	All		Table 3-5--This table implies that Bruin Point is public land. This is incorrect. Most of Bruin Point is privately owned and not subject to federal restrictions on recreation and other uses.
18.79	42	1	2	Cultural Resources--The statement that since nearby districts contain documented cultural sites, one could reasonably expect to find similar

	Page	Column	Para.	
18.79 cont.				sites in the Sunnyside STSA is not supported by fact. Accordingly, such an assumption does not appear to be justified.
18.80	99	2	3	Analyses, Assumptions, and Guidelines--Guideline 5 specifies that a worst case analysis will be employed in all cases where alternative options are available. This methodology appears to be inconsistent with CEQ guidelines proposed in August, 1983, which propose a test of reasonableness for worst case analysis.
18.81	50	2	4	Resource With Limited Data or NO Impacts, Air Quality--Sunnyside Tracts 1-9--We feel conclusions regarding possible excursions of NAAQS or PSD increment are unfounded (per our review comments on the Air Quality Technical Report), because of the inaccurate air quality analysis which was used to develop these conclusions.
18.82	56	2	3	Animal Life--The impact on mule deer range is less than three percent, and the estimated impact is only three percent of the deer herd. These impacts should not be considered significant when compared to the benefits resulting from development.

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18.82 cont.				Similar impacts are expected on elk herds, as discussed in Vols. 1 and 2. These minimal impacts must be balanced against benefits which would be foregone by restrictions on development.
18.83	57	All		Table 4-3--This table shows only an insignificant impact on deer and elk range, aspen habitat, small game habitat, and year-long raptor habitat resulting from development Sunnyside Tract 4. These minimal impacts, when compared to benefits of development, do not appear to justify limitations on development of Sunnyside Tract 4.
18.84	60	1	6	Tracts 3 and 4--This discussion implies that Sunnyside Tract 4 can be separated from fee-owned land on Bruin Point. Limitations on development of Tract 4 for visual purposes would be incongruous with development on fee-owned land adjacent to Tract 4 and could effectively preclude or limit development of privately owned resources.
18.85	62	1	6,7,8	Vegetation, Sunnyside Tracts 2-9--The stipulation limiting development to no more than 25 percent of a tract at one time, preventing development until vegetation is reestablished and preventing

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18.85 cont.				development on slopes greater than 50 percent may not be consistent with efficient resource development and may not consider the benefits foregone from loss of development. Moreover, the impact of development on vegetation on Sunnyside Tract 4 is minimal and does not justify a broad proscription, such as that proposed for this impact.
18.86	63 63	1 2	All 1,2,3	Animal Life--As stated under Alternative 1, the impact of development on Sunnyside Tract 4 on animal life is not significant, especially in consideration of the benefits of development. Accordingly, no limits on development on Tract 4 for animal life values appears to be justified.
18.87	64	2	5	Visual Resources, Sunnyside Tracts 3 and 4--Restriction of development of Tract 4 to 25 percent at any one time is unrealistic and unreasonable and inconsistent with efficient resource development.
	65 65 67 68	1 2 All 1	5,6 All 3	Alternative 3--Comments stated above applicable to Alternative 1 apply equally to Alternative 3.

	Page	Column	Para.	
	69	1	4,5,6	Vegetation--Comments applicable to Alternative 2 for Sunnyside Tract 4 apply to this analysis.
18.88	69 69	1 2	7 1-4	Animal Life--Because of the insignificant impact of development of Sunnyside Tract 4 on animal life, no limitations on development can be justified, especially in consideration of the resource values foregone by such limitations.
	69 70 70	2 1 2	5,6 All 4	Unique and Limited High Value Wildlife Habitat, Recreation, and Visual Resources--Comments on Alternative 2 regarding the impact of development of Sunnyside Tract 4 on these values apply to those sections.
18.89	70	2	5,6	Alternative 5--This alternative does not provide for balanced resource development and reasonable protection of the environment and accordingly should be rejected as being inconsistent with multiple use criteria established by DOI.
18.90	79	2	6	Appendix 1--Stipulation 9 prejudges the impact on exploration and drilling on ranges and habitats. Such a presumption appears to be unjustified. Seasonal restrictions should be applied only if

	Page	Column	Para.	
18.90 cont.				determined to be justified at the time of application and in consideration of the drilling and exploration program proposed.
18.91	82	2	3	Stipulation 13--Seasonal restrictions on development should only be imposed based on circumstances applicable to the time of application and in consideration of the proposed development program. Restrictions must consider the benefits of resource development which may be foregone by such restrictions.
18.92				General: The only alternative which appears to be justified for Sunnyside Tract 4 is Alternative 1, because of the insignificant impact of development on this tract on the values discussed in this volume. Accordingly, Sunnyside Tract 4 should be placed in Category 1 in all alternatives.

18.1 The EIS presents impacts without regard to whether they are beneficial or adverse, except in the section where BLM is required to list unavoidable adverse impacts (see Volume I, pages 29-31 of the Draft EIS). The analysis assumptions and guidelines are clearly stated in Volume I, page 93 of the Draft EIS. These assumptions are the basis for the balance of the analysis.

18.2 The rationale for the alternatives analyzed in Volume I of the Draft EIS is explained in Appendix 1. Alternative 1 is based on the information submitted by five companies regarding future tar sand development in the Sunnyside STSA.

This alternative analysis represents the effects of tar sand development which are reasonable and may come to pass if the companies exercise their development options. Decisions on those options will depend, to a large measure, upon future market and financial conditions.

Therefore, the analysis of the High Production Alternative is not only justified but required to fulfill BLM requirements under the NEPA regulations. The proposed CEQ guidelines published in the Federal Register in August 1983 have been withdrawn.

18.3 The comment will he considered in the decision-making process. Note, however, that the No Action Alternative is one alternative required by NEPA regulations. No decisions on production or leasing levels will he made as a result of Volume I analysis; interested companies will determine the level of tar sand development, based on acceptable plans of operations submitted to BLM.

18.4 Refer to Letter Response 2.19.

18.5 BLM intended to say that the NO_2 NAAQS could be exceeded. The text in Volume I of this Final EIS has been revised accordingly.

18.6 The objective for the air quality analysis is to forecast impacts under the production scenarios presented in this EIS. As such, it will serve as a tool that will he used with other documentation for planning and decision making. The PSD permitting process would he a follow-up determinate to identify future levels of on-the-ground development. The air quality projections in this EIS show that, in some cases, the estimated production levels would violate existing environmental regulations.

18.7 The proposed May competitive lease sale has been postponed. Adequate planning and time for a decision on the leasing of each tract is expected.

18.8 Production level estimates were determined as discussed in Volume I, Appendix 1. Note that the alternatives in Volume I are based on production levels and were not developed from specific plans of operations. Production levels could include competitive or conversion leasing. Analyses were done in accordance with alternatives as presented in this EIS and addressed cumulative effects. As plans of operations are examined, site-specific analyses will be completed by an EA or EIS, where appropriate. Water requirements, air pollution, socioeconomics, water quality, etc., will he analyzed in that setting and tiered to this Regional EIS. Also, refer to Letter Response 15.17.

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18.9 Refer to Letter Response 18.1.

18.10 Volume I, Footnote c in Table 3-1 has been amended to show concentrations given in ug/m^3. The range of numbers indicates the range in monitored concentrations measured in the area. The annual TSP values are annual geometric means. Footnote d has been amended to show that concentrations for carbon monoxide have not been established.

18.11 Volume I, Table 3-2 of this Final EIS has been amended to show TSP annual geometric mean, NO_2 and SO_2 annual arithmetic means, and deletion of the hydrocarbon standard.

18.12 Coal deposits of commercial quantities which may underlie the Sunnyside STSA would probably he confined to the Mesa Verde Group and Mancos Shale. Any coal which may underlie the STSA is buried so deeply that it could only he recovered by underground mining methods. Volume I of this Final EIS has been amended to include this information.

18.13 As stated in the comment, most of the Bruin Point area is in private ownership. This was not clearly shown in the reference cited in the comment; however, the pocket map (located in the back of Volume I) does show that surface land ownership in the Bruin Point area is predominantly private although the Federal holdings in the area are significant.

18.14 Volume I, Chapter 4, Alternative 1, Sunnyside STSA, Cultural Resources section begins by stating that: "Cultural resources are not well documented" in this STSA. However, several inventories have been conducted in the immediate vicinity that have documented the presence of various kinds of sites in the surrounding area. Based on the information that has been generated to date on prehistoric settlement patterns, we know that the cultural groups in question ranged over considerable territory. Fremont and Anasazi groups were never limited to specific locales. It is a valid and professionally acceptable assumption that the types and cultural affiliation of the sites that have been documented nearby are generally representative of the cultural resources most certainly present in the Sunnyside STSA.

18.15 Refer to Letter Response 18.2.

18.16 Refer to Letter Responses 2.19 and 18.6.

18.17 Refer to Letter Response 2.19.

18.18 The air quality data for this Regional EIS were extracted from the regional air quality technical report prepared by Aerocomp, Inc. (1983a). Comments on the Sunnyside air quality technical report

(Acrocomp, Inc., 1983b) will be responded to in the Sunnyside Final EIS.

Also, refer to Letter Response 2.19.

18.19 Refer to Letter Responses 2.19 and 18.6.

18.20 All substances which were introduced into the environment would be tested to ensure that they were in conformance with State and Federal regulations. Surface and groundwater monitoring, which would be required in any approved plan of operations, would aid in compliance with these regulations. A change was made in Volume I, Chapter 4, Alternative 1 (Regional Overview), Water Quality section of this Final EIS to reflect this portion of the comment.

BLM has also considered the fact that all waste material, including overburden and spent sand (which could contain up to 5-percent bitumen and residual amounts of any processing chemicals) would be mixed together and dumped in waste rock disposal sites. Concentrations of toxins from overburden or the spent sand, while not exceeding toxicity levels at the present, could build up or combine with other naturally occurring substances in the rock and eventually exceed the allowable limits for the substances as set by State or Federal agencies. This information has been added to Volume 1, Chapter 4, Alternative 1 (Regional Overview), Tar Sand section in this Final EIS. Should these concentration levels be reached, they could take several years to dissipate or be removed from the groundwater system.

18.21 Adequate public disclosure of impacts identified in the EIS process makes it necessary to provide definitions of technical terms for the general layman. Primary NAAQS are intended to protect public health; therefore, definitions of air pollutants should include the significance of possible adverse human health effects regardless of the concentrations from one source.

18.22 The site selected would influence the design and size of the bolding pond. A 100-year storm event may, in one location, be relatively small, yet in another area quite significant in respect to protecting the water resource from degradation. This would require site-specific analysis from a submitted plan of operations.

18.23 The impacts discussed under Volume 1 are significant because they would occur to crucial range. Crucial range is defined as "that portion of wildlife habitat essential to the survival and perpetuation of a certain species in an area" (see Glossary).

18.24 As used in this EIS, "project life plus 5 years" is defined as that period of time that would begin upon initial clearing, stripping, or occupation of the soil's surface and last until 5 years after the area was reseeded.

An area cannot be reclaimed until mining of that area is completed. The period of time that any particular area within an STSA would be mined is unknown. It is realized that the processes of mining and revegetating could take place side by side. Also, refer to Volume 1, Chapter 4, Analysis Assumptions and Guidelines section, Assumption 3 and Letter Response 2.21.

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18.25 BLM has contacted UDWR to verify such information as crucial deer and elk range and population estimates. This consultation has resulted in the change of some of the numbers in the Draft EIS. All corrections are included in this Final EIS. It is important to note that this Regional EIS is concerned only with crucial big game range. Therefore, because the numbers you present in your comment refer to total range size, our final figures will probably differ somewhat from that stated in the comment.

18.26 It is true that BLM leasing stipulations should protect sage grouse habitat. However, it is BLM's opinion that, if the production levels under the high commercial scenario (Alternative 1) were met, leasing stipulations might not be able to protect all sage grouse strutting and nesting areas. Analysis shows that, if this level occurred, all impacts to sage grouse strutting and nesting sites and golden eagle nesting sites could probably not be completely avoided because of the large amount of acreage disturbed.

18.27 It is not expected that populations of channel catfish and black bullhead in the Green River would be impacted due to flow reduction; however, these populations could be affected from possible leaching, contamination, and water diversion facilities as noted in Volume 1, page 138 of the Draft EIS.

The Green River aquatic habitat is especially important for two endangered species, Colorado squawfish and bumpback chub. As pointed out in Volume 1, Chapter 4, Alternative 1 (Regional Overview), Aquatic Threatened and Endangered Species section, any water depletions from tributaries to the White, Green, or Colorado rivers are of major concern to Federal and State agencies. Impacts to the Colorado squawfish and bumpback chub could occur from degradation of water quality and reduction of instream flows in the White, Green and Colorado rivers and their tributaries. Because project descriptions and/or tract analysis assumptions do not contain sufficient information to make a full determination as to whether or not the eventual development of any of the potential lease tracts or conversions would jeopardize the continued existence of the Colorado squawfish or bumpback chub, it would be necessary for BLM to request consultation with FWS on a project-by-project basis as each plan of operations was reviewed for approval.

18.28 The loss of animal unit months (AUMs) could be mitigated, although not necessarily easily. The actual value of an AUM on rangeland to a livestock permittee differs from area to area and from operation to operation. In general, however, 1 AUM on rangeland in Utah is worth $7.24 (Allen, 1983). Thus, 625 AUMs are worth $4,525 per year. Livestock permittees depend on the use of these AUMs every year, and alternate range is probably not available. If the livestock permittee fed hay at $70 a ton to replace the 625 AUMS, it would cost an estimated $17,500 per year.

18.29 Refer to Letter Response 18.8.

18.30 Refer to Letter Response 18.23.

18.31 Refer to Letter Responses 2.19 and 18.18.

18.32 Refer to Letter Response 18.21. The text in Volume I, Chapter 4, Alternative 2 (Regional Overview), Air Quality section was revised to state that SO_2 is not a pungent gas at concentrations below the 3-hour secondary NAAQS.

18.33 As discussed in Volume I, Appendix 1, where data were submitted by companies, they were used in developing production estimates. Estimates in other STSAs were strictly projections based on possible oil and gas lease conversion areas and new leasing potential; these levels were used to analyze a high commercial production level. Refer to Letter Response 18.8.

18.34 The mere existence of resource values is not sufficient to justify any special categorization. In Volume I, Appendix 2, Guideline 1 states: "Unless special or significant other natural resource values are involved, public lands will be in category 1. Standard surface disturbance stipulations which are a part of an oil and gas lease will generally provide adequate protection for the resource values." Guideline 3 states that if these values "...may be unavoidably and irreparably impacted, an area may logically be placed in categories 2, 3, and 4." How restrictive the category is depends on how important the resource is and the magnitude of the expected impact.

Refer to Volume I, Appendix 2 for guidelines on tar sand development.

18.35 Volume I, Appendix 2, Special Stipulation 7 refers to "exploration, drilling, and other development activity." The text in Volume I, Appendix 2 of this Final EIS has been amended to delete language that would restrict the stipulations to only oil and gas wells.

18.36 The general guideline for category 3 (see Volume I, Appendix 2) states that, in order to justify the stringent category 3 designation, the considerations that prompted it must be well founded and defensible. If an area were left in category 3, future technology might allow tar sand development. A category 3 designation would also leave that tract open for oil and gas development using present technology.

18.37 These stipulations (Volume I, Appendix 2, Special Stipulations section) are designed to protect specific resources and do not acknowledge any difference between conventional oil and gas development and tar sand development. The stipulations would apply to any and all surface-disturbing actions.

18.38 Volume I, Appendix Table 5-1 of this Final EIS has been amended to show TSP annual geometric mean, NO_2 and SO_2 annual arithmetic means, deletion of the hydrocarbon standard, and standards expressed in ug/m^3.

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18.39 Refer to Letter Response 2.19.

18.40 Major issues were identified as concerns by government agencies and the public in the scoping process. Refer to Volume II, page 66 of the Draft EIS for a detailed list of public concerns for the Sunnyside and Vicinity STSA (Southern Portion). Also, refer to Letter Response 18.1.

18.41 Under the Sunnyside STSA high production scenario, SO_2 and TSP are expected to exceed the PSD Class II increments. TSP levels would greatly exceed NAAQS. NO_2 violations could occur to NAAQS. Analysis of the low production scenario indicates that the TSP NAAQS and Class II increments could be exceeded (Aerocomp, Inc., 1983a). This means that additional pollution control measures would be required so that projects could be granted PSD permits. Also, refer to Letter Responses 2.19 and 18.6.

18.42 The impact analyses assumed the worst-case situation. The basis for analysis is described in Volume II, page 10 of the Draft EIS (Development of Alternatives for STSAs section). Also, refer to Letter Responses 18.1 and 18.2.

18.43 NEPA directs Federal agencies to consider a range of alternatives to any proposed course of action. Some of those alternatives are more responsive to certain needs than others. Alternative 4 was designed to protect the natural resources present in the area, not to maximize tar sand development. This alternative is consistent with NEPA and the principles of multiple use and is a viable alternative. The statement referred to in Volume II, page 85 of the Draft EIS states that Alternative 4 would make much of the tar sand deposits unrecoverable because the impacts resulting from surface mining would not be consistent with resource protection.

No alternative has been selected for implementation. Volume II of the EIS examines a range of alternative development scenarios that will be used to formulate a decision at some future time.

18.44 The Roan Cliffs portion of the Sunnyside and Vicinity STSA is visible to travelers on U.S. 6 as well as secondary highways southwest of the STSA (Wellington to Price segment). Average daily traffic (ADT) is 8,700 (Utah Department of Transportation [UDOT], 1982). The ADT figure was revised in Volume II of this Final EIS.

18.45 The environmental protection afforded by Alternative 1 is not the same as that proposed in Alternatives 2 and 3. This is illustrated below by comparing the acreage in each category by alternative.

	Acres		
Category	Alternative 1	Alternative 2	Alternative 3
1	71,167	16,161	0
2	1,420	49,343	67,269
3	0	8,966	7,641
4	2,320	440	0

If the existing situation (Alternative 1) were to continue, additional mitigation would have to be applied to comply with existing laws and regulations. Under the other alternatives, this additional mitigation would already he in place, and any prospective developers would know ahead of time what situation they were dealing with.

18.46 Under Alternative 1 (No Action), the categories would remain as in the present management plan for the area. This would leave the upper reaches of Range Creek in category 4.

18.47 Refer to Volume 11, Sunnyside and Vicinity STSA (Southern Portion), Alternative 3 section, page 71 of the Draft EIS. If Alternative 3, Multiple Use (Preferred Alternative) were selected, the Sunnyside Water Supply Reserve would he in category 2, subject to the stipulation as described under this alternative. Also, refer to Letter Response 18.46 for a discussion as to why a range of alternatives are developed.

18.48 These watersheds were placed in category 3 because of steep slopes, erosion hazards, lack of reclamation potential, and other concerns as described in Volume II, Alternative 2, No. 111, Public Water Reserves/Riparian Areas section, page 68 of the Draft EIS.

18.49 These watersheds were placed in category 3 because of steep slopes, erosion hazards, lack of reclamation potential, and other concerns as described in Volume II, Alternative 2, No. 113, Bear and Rock Creek Watersheds section, page 68 of the Draft EIS.

18.50 The reason for proposing protection of the Range Creek Watershed with a stipulation limiting surface or in-situ mining is to protect the watershed from damage. All proposed in-situ mining practices require closely spaced injection and recovery wells and sufficient cap rock to preclude air filtration from the surface or steam migration to the surface. Because of this, in-situ development would not he compatible with protection of the watershed. Surface mining, which would disturh all of the surface, would also he incompatible with protection of the watershed.

18.51 Because complete reclamation of steep slopes in the Roan Cliffs area, including deer and elk summer and winter ranges, would not completely mitigate impacts, it was suggested that no in-situ or surface mining activities he allowed. It is important to note that much of this area is in excess of 50-percent slope. This stipulation would not preclude all mineral development hecause it would still allow oil and gas resources to be extracted by conventional methods. This stipulation would apply under Alternative 2. However, it does not apply under Alternative 3, the preferred alternative. It is important to note that the decision-maker could choose either alternative.

18.52 The stipulation referred to may he modified by the authorized officer of the BLM. This allows the stipulation to serve as a guideline to he applied on a case-hy-case hasis.

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18.53 Refer to Letter Response 18.46. Alternative 3, which includes the "no discharge" stipulation for the Sunnyside Water Supply Reserve, is the most development-oriented alternative heing examined for that Reserve.

The alternatives for the Sunnyside STSA are as follows: (1) Alternative 1, category 4 (2,320 acres); (2) Alternative 2, category 4 (460 acres) and category 3 (1,960 acres); (3) Alternative 3, category 2 (2,440 acres) and a no discharge stipulation; and (4) Alternative 4, category 4 (2,400 acres).

18.54 This area was placed in category 3 hecause of its susceptihility to erosion and sedimentation hazards, as well as the potential for dewatering of the public water reserves. Because of the importance of this area as a water reserve, riparian area, and floodplain of major intermittent and perennial streams (some of which support trout populations), it was determined that category 2 would not provide adequate protection.

18.55 All disturhances associated with a mining operation, roads, pits, top soil storage, processing facilities, etc., constitute land disturhed by surface mining. Refer to General Response 1.

The 25-percent stipulation includes lands under reclamation on which revegetation is not substantially advanced. By limiting surface disturhance to 25 percent of an area at any given time, remaining vegetation cover would provide soil protection, thus keeping the majority of watershed in production. This is the principle consideration on areas where surface disturhance is limited. It should he noted that this figure could he modified hy an authorized officer of the BLM on a case-by-case hasis.

When an area has heen contoured and seeded, including hydromulching, transplanting, etc., an area is considered completely revegetated. A determination as to whether a revegetation attempt is substantially advanced will he made by the authorized officer 5 years following completed reclamation. The guide used in this determination will he the regulations developed by the Office of Surface Mining (1983) for surface coal mining (30 CFR 816) with the exception that the standards for success will he hased on plant diversity.

These definitions were provided by the USDI, BLM (1984). It is possible, depending on the site, topography, soils, etc., that these stipulations could cause delays in mining operations. However, reclamation of the area is still a primary concern.

18.56 The stipulation specified under No. 116, Range Creek Watershed (Volume II, Chapter 2) is designed to protect a locally important aquifer; in this case, the Middle Parachute Creek Member of the Green River Formation. The aquifer, of large areal extent on Valley Mountain and the northeast-trending ridges, feeds over 200 known springs within and just outside of the STSA. These springs are important water supplies for livestock, wildlife, and riparian habitat and provide for perennial haseflow in some springs. For a definition of "complete hydrological testing" refer to Volume II, Glossary of this Final EIS which states that, "The hydrogeologic evaluation shall be of an extent capahle of predicting whether or

not mining activities will interrupt the flow of springs or reduce the baseflow of perennial streams." The adequacy of the evaluation shall be determined by the authorized officer of BLM.

18.57 Refer to Letter Responses 18.24 and 18.55.

18.58 Refer to Letter Response 18.56.

18.59 Refer to Letter Responses 18.24 and 18.55.

18.60 The comment that all aspen communities do not have equal value could be correct for areas where there are extensive aspen stands. However, because there are so few high-value aspen communities on crucial deer/elk summer ranges within the Sunnyside STSA, any loss would be significant. Therefore, the stipulation requiring off-site enhancement of equal wildlife value would be appropriate.

18.61 Refer to Letter Responses 18.24 and 18.55.

18.62 Refer to Letter Response 18.56.

18.63 The stipulation to preclude exploration, drilling, and other developmental activities between May 17 and July 16 would protect deer/elk summer range during the fawning/calving season. This time is critical in the life cycle of these animals, and any stress associated with mineral activity could seriously affect their reproductive success.

It would appear that there is sufficient time between July 16 and November 1 to allow companies the opportunity to gather sufficient exploration and production data to develop adequate plans of operations. BLM feels this stipulation is a reasonable mitigation measure and would not eliminate tar sand exploration or development.

18.64 Alternative 4 is only one of the alternatives being considered for the southern portion of the Sunnyside STSA. The comment will be considered in the decision-making process.

18.65 The Sunnyside Water Supply Reserve was placed in category 4 under Alternative 1 for its protection while making the most area available to leasing with the least restrictions. Under Alternative 3, the reserve was placed under category 2 with a special stipulation (see Volume II, page 71 of the Draft EIS). This reserve would be afforded additional protection under this alternative because it falls within the Range Creek Watershed (No. 116) (see pages 71-72). It also must be remembered that the scaling of alternatives from maximum production (Alternative 1) to maximum resource protection (Alternative 4) is based on the total number of acres in each category, not on a single area. Note that in Alternative 1, 95 percent of the STSA is in category 1, while in Alternative 3, none of the STSA is in category 1.

18.66 The reasons for the differences in the treatment of the Sunnyside Water Supply Reserve under the various alternatives are explained in Letter Response 18.65; these differences comply with the

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NEPA process. The intent of PL-294 is to protect the area providing a stable water supply to the Town of Sunnyside. Categories 3 and 4 may be required to prevent damage from sediment and subsidence to diverting works and to prevent changes in the hydrologic balance of the watershed.

18.67 The public water reserves and riparian areas in the Sunnyside STSA are limited in size, are fragile in nature, and are important to wildlife and plant ecology as well as communities obtaining their municipal water from these areas. Therefore, in view of their importance, their protection under Alternatives 2 and 3 was deemed necessary.

18.68 Stipulation 120 was applied to protect the west slopes of the Roan Cliffs. Surface mining could affect important wildlife habitat and scenic values. If the area were surface mined and reclaimed, some wildlife habitat values might recover. However, present scenic values would be permanently lost from extensive alteration of the steep-sloped topography and possible permanent alteration of vegetation composition on the mined areas and disposal sites.

18.69 The impacts discussed under Volume 1 are significant because they would occur to crucial summer range. Crucial range is defined as: "That portion of wildlife habitat essential to the survival and perpetuation of a certain species in an area." Because the loss of crucial range is a significant resource issue, Areas 121 and 123 require reasonable mitigation measures to reduce impacts. It is important to note that any impact to crucial range could impact those populations dependent on that habitat, especially in the cumulative sense. For instance, ten different projects could individually impact only 2 percent of a habitat type. Therefore, it might be argued that no single project by itself would cause any significant impact. Collectively, however, 20 percent of the habitat type could be destroyed from these ten projects.

18.70 Efficient resource recovery, loss of development, and compatibility with tar sand mining are not the primary issues. Refer to Letter Response 18.55.

To provide a balanced approach to land use, it is necessary to look at the potentials and capabilities of the resources and to develop stipulations which could guide development in any sensitive areas. This provides a framework whereby leasing companies can develop mitigation for inclusion in their plans of operations for consideration by BLM.

18.71 The Public Attitudes section (Volume II, page 85 of the Draft EIS) does not mean to imply that local governments and citizens are opposed to all further growth. The analysis suggests that rapid, uncontrolled growth would not be desirable.

18.72 Refer to Letter Response 18.13.

18.73 General Policy Guidelines 9 and 13 (Volume 1, Appendix 2) are only imposed when mitigation may be necessary to protect a signifi-

cant resource issue (e.g., crucial big game range, municipal watershed, and important lakes and reservoirs) and then only for specific situations. Because these guidelines are proposed only to protect significant resource issues and were not applied in an "across-the-board" fashion, BLM believes their analysis in this EIS is useful. It should be noted that these guidelines may be modified by an authorized officer of the BLM on a case-by-case basis.

18.74 The decision not to hold the lease sale is analyzed as the No Action Alternative in Volume III.

18.75 Volume III, Table 3-1 and Volume I, Table 3-2 acknowledge that PSD standards should not be exceeded more than once per year, other than those for ozone or those based on an annual average.

18.76 Volume III, Table 3-1 has been amended to show TSP annual geometric mean, NO_x and SO_2 annual arithmetic means, and deletion of the hydrocarbon standard.

18.77 The range of concentrations is based on ranges of data monitored in the area. The CO concentrations would have been in ug/m^3, and this has been changed accordingly on this chart in Volume III, Chapter 3. Additionally, mg/m3 has been deleted from the table footnote. The footnote also shows that TSP values are an annual geometric mean and SO_2 and NO_2 values are annual arithmetic averages.

18.78 Refer to Letter Response 18.13.

18.79 Refer to Letter Response 18.14.

18.80 Refer to Letter Response 18.2.

18.81 Refer to Letter Response 2.19.

18.82 Refer to Letter Response 18.69.

18.83 The impact of development on wildlife habitat on Sunnyside tract 4 is significant because it would occur on crucial big game range. Crucial wildlife habitat is defined as "that portion of wildlife habitat essential to the survival and perpetuation of a certain species in an area.") Therefore, special seasonal stipulations, as outlined under General Policy Guidelines for Oil and Gas Leasing (see Volume 1, Appendix 2), are appropriate for this lease tract. It is important to note that the limitation placed on this tract does not apply to maintenance and operation of any producing facilities and that exceptions to this limitation in any one year may be approved by the authorized officer of the Federal surface management agency.

18.84 The assumption is that Sunnyside tracts 2, 3, and 4 would be developed with adjacent conversion lease tracts on State or private areas. Degradation of scenic resources would result from tar sand development; however, this would not preclude development. The VRM

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class standards are goals for limiting visual impacts. The decision-maker must recognize when VRM goals would not be met, but is not bound by the VRM goal in any decision.

18.85 Refer to Letter Responses 18.52, 18.55, and 18.70.

18.86 Refer to Letter Response 18.83.

18.87 In view of the size of the tracts (120 and 40 acres for Sunnyside tracts 3 and 4, respectively), the category 2 stipulation that would limit surface disturbance to 25 percent at any one time could cause inefficient mining operations. That, however, was the stipulation proposed under Alternatives 2 and 4 to protect elk and deer crucial summer ranges. It should be noted that exceptions to this stipulation may be made when specified in writing by the authorized officer.

18.88 Refer to Letter Response 18.83.

18.89 The comment will be considered in the decision-making process. Please note that the analysis of the No Action Alternative (Alternative 5) is required by NEPA regulations.

18.90 The paragraph referred to is a general policy guideline, not a stipulation. As noted at the beginning of Volume III, Appendix 1: "Adherence to these guidelines is desirable, but management must fit the specific situation."

18.91 Refer to Letter Response 18.90.

18.92 This EIS does not represent a decision document, but rather examines a range of alternative development scenarios that will be used as one of the tools on a final decision for tar sand development.

Comment Letter 19

Mobil Alternative Energy Inc.

P.O. BOX 17173
DENVER, COLORADO 80217

January 17, 1984

Mr. Roland G. Robinson
State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, UT 84111

COMMENTS ON UTAH COMBINED
HYDROCARBON REGIONAL DRAFT
ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. Robinson:

Mobil Alternative Energy Inc., appreciates the opportunity to submit comments on the referenced document. Detailed comments on assumptions for alternatives, design considerations, general environmental consequences and air quality analysis are attached.

Mobil concurs with the BLM that this regional analysis OEIS is a valuable and useful tool in a regional planning process. The BLM's unqualified, absolute statements and terminology could lead to a misinterpretation of the OEIS' intended purposes. Because of overstatement of projected industry production, BLM has gone beyond worst-case analysis in describing environmental impacts. In addition, many of the impacts discussed are hypothetical and are based on little, if any, site-specific data, project design or mitigation measures.

We hope our attached comments will be of assistance in preparing the final EIS. If you have any questions please contact J. C. Hansen at 303/293-6284.

Yours very truly,

J. C. Hansen
Tar Sands Venture Manager

TFDavis/gh
Attachment

cc: R. R. Neyrey (w/attachment)

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ATTACHMENT

Mobil's Comments on BLM's Draft
Utah Combined Hydrocarbon Regional EIS

ASSUMPTIONS FOR THE ALTERNATIVES

General

19-1 The OEIS has grossly overstated industry production resulting in unrealistically high environmental impacts.

Alternative 1: High Commercial Production

The high commercial production case of 365,000 B/D on federal lands plus an additional 30,000 B/D on private lands, is too high by at least a factor of 2. Technology for the bitumen extraction of mined Utah tar sands has not been demonstrated. To our knowledge, no pilot plant runs of any process have yet been made which produce clean (sand-free) bitumen over a long-term operation. Several process concepts are under development; however, it may take 5 years or longer before these process concepts are proven to the point where major scale-up can occur. Even at that point, the initial scale-up would probably be at 1,000 - 2,000 B/D rather than the commercial size of 10,000 - 20,000 B/D. Following demonstration at the 1,000 - 2,000 B/D level, it could take up to 12 years to design, permit and construct a commercial facility. On this time scale, the earliest possible commercial surface mine/plant operation would be 15 years. In situ extraction technology is in about the same state of development. Therefore, from a technology, permitting, design, and construction viewpoint, we belive it is impossible to have a 395,000 B/D tar sand industry on stream in 20 years.

A deposit-by-deposit analysis also results in the conclusion that Alternative 1 is unrealistically high. For example, at P R Spring, to our knowledge, commercial tar sands development interest is only relatively modest at this time. Given the time it takes to block up sufficient acreage, it is unlikely

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19.1 cont. that 100,000 B/D of synfuels could be produced on federal lands at P R Spring by 2005. At Sunnyside, more companies have been active than at P R Spring; however, given the amount of recoverable resource, and the timing, we believe that it is more likely that 75,000 B/D is the most that could be achieved on federal lands at Sunnyside by 2005, not the 125,000 B/D shown. Finally, at Tar Sands Triangle, in view of the difficulty anticipated in permitting, due to the close proximity of wilderness areas and national parks, the projection of 70,000 B/D from federal lands appears unrealistic.

In addition to these factors, the present surplus supply of oil and gas has substantially diminished the incentive for synfuels. The OPEC countries have found it necessary to drop the oil price from $34/B to $29/B. Further drops are possible. Therefore, little incentive currently exists to proceed with tar sands development, particularly on a time table that would achieve 395,000 B/D by 2005.

It should also be pointed out that the production levels in Alternative 1 are high relative to those in BLM's previous FEIS for Uinta Basin Synfuels Development. For deposits in the Uinta Basin, Alternative 1 assumes 255,000 B/D production from federal lands plus an additional 30,000 B/D from private lands for a total of 285,000 B/D. In contrast, the Uinta Basin Synfuels Development FEIS assumed production of only 75,000 B/D from federal lands plus 20,600 B/D from private lands for a total of 95,600 B/D.

Alternative 2: Low Commercial Production

In our opinion, the projected low commercial production figure of 83,000 B/D is much closer to the expected upper level of commercial production. A more realistic level of low commercial production would be 40-50,000 B/D.

OEGIGN CONSIDERATIONS

19.2 Disposal of Waste Sand (Tailings)

The method of disposal of waste sand proposed in the OEIS is a tailings pond. This is the disposal method for sands produced by the hot water process used

19.2 for Athabasca tar sands. Such tailings ponds could not be used in western U.S. plants due to the tremendous volumes of water which would be wasted. The most reasonable disposal plan for the spent sand would be deposition in a gully or valley. Disposing of the spent sand in this manner would reduce the disposal area to the order of 1,000 - 2,000 acres per 25,000 B/D tar sands plant. This is much less than that predicted by the BLM.

19.3 Transportation

The OEIS assumes that upgraded bitumen will be transported primarily by truck, with some shipment by rail where existing railroads are available. The truck/rail assumption is unrealistic and results in an overstatement of environmental impacts. The more likely transportation mode for Alternatives 1 and 2 would be pipeline, with significantly lower environmental impacts.

19.4 Energy Efficiency

The OEIS does not indicate how the low energy efficiency of 65% for bitumen production was determined. Mining is a very energy-efficient operation - in the order of 95% or better. Bitumen extraction is a low-temperature process and is also very efficient - 90%. Transportation of raw material and product should not reduce efficiency significantly. Indirect energy should be small - the infrastructure energy in the project area should be compensated for by the diminished infrastructure required at the point of origin of the work force. Therefore we feel the energy efficiency calculated by the BLM is erroneous.

GENERAL ENVIRONMENTAL CONSEQUENCES

19.5 Water quality, water rights, and aquatic ecology effects are not properly qualified. Until the specific streams to be affected and the nature of the effect are known, it is not appropriate to hypothesize significant impacts. Certainly BLM should not relate impacts due to accidental releases or other design deficiencies. It is not reasonable for the BLM to assume that projects

19.5 cont. will not be based on responsible, standard engineering and operational practice - this is in any case enforced by law. Also, it is not appropriate to quantify costs of increases in salinity in the Colorado River at this time.

19.6 The BLM should explain their statement on Page 111, "Depending on the magnitude to which these impacts occurred, the total elimination of fisheries could result." Considering the size and location of many of the rivers and streams and projected total water depletions from these rivers, it seems highly unlikely the "total elimination" of a fisheries would occur.

19.7 When discussing effects to acres of soil, vegetation, habitat, etc., in the Summary, it should be made clear that the significant effects will be based on the actual acres affected. BLM has no project design on which to base significance of surface effects at this time. BLM should also point out that effects can be minimized by avoiding critical areas and reclaiming affected areas.

19.8 Several statements are made in the EIS which indicate that development of STSA's could "eliminate or greatly reduce" populations of wildlife (i.e., sage grouse, elk, big horn sheep, mountain lion, black bear, etc.). This worst case assumption expresses an alarmist attitude and cannot reflect an accurate scientific assessment without site-specific quantitative baseline data.

19.9 In addition, comparison of existing habitat to potentially disturbed habitat for many of the above species indicates that only relatively small percentage of habitat would be reduced. Minor reductions in habitat are unlikely to eliminate an entire species population. The BLM should explain, in all cases why elimination or great reductions in populations of species would occur due to small reductions in habitat.

AIR QUALITY ANALYSIS

General

19.10 It is inappropriate to state that PSD increment limitations and National Ambient Air Quality Standards will be exceeded at any level of development. Atmospheric effects are extremely sensitive to the type and location of facilities and operations and to site-specific meteorology. In complex terrain, meteorology tends to be location-specific; using regional data as was done in the DEIS does not provide a representative analysis of atmospheric effects. Facilities and operations location (i.e., high or low elevations) also has a significant impact on determining atmospheric effects. When evaluating cumulative effects, the relative location of projects is critical in the analysis. The type of operation and possible mitigation measures must be known to meaningfully estimate atmospheric emissions; BLM has none of this information available, therefore to say that standards will be exceeded is unreasonable. All that BLM has established with its analysis is that atmospheric effects could limit industry development and that more project-specific analysis is required.

19.11 The EIS' projected violations of National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments for the high development scenario and to a lesser degree for the low development scenario are not likely to occur. Air quality projections are made in the EIS using a hypothetical development scenario, crude emission factors and inexact modeling methods which tend to be conservative. Therefore the air quality projections are subject to tremendous uncertainty. It is recommended that instead of reporting air quality modeling results as single worst-case numbers, this DEIS should reflect modeling accuracy levels by reporting the results as a range, with the lower end of the range being one-tenth of the worst-case figure, as was done in BLM's Federal Oil Shale Management Program DEIS (February 1983) and BLM's Uinta Basin Synfuels Development DEIS (August 1982).

19.12 Current air quality regulations require that a new source demonstrate that it meets all air quality regulations before it can receive a construction permit.

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19.12 cont. Detailed air quality analysis will be required for most tar sands facilities. When these analyses are conducted, more precise estimates of the emissions from each project will be available and more exact modeling techniques can be applied. To obtain state and federal permits, the projects will be designed so that no violations of air quality standards would be projected to occur.

Emissions Estimates

19.13 The emissions estimates used in the air quality analysis are merely rough estimates, and therefore the resulting environmental consequences are very uncertain. In the EIS, assumptions were made concerning the level of development in each Special Tar Sands Area (STSA), the method of extraction and processing used in each STSA, and the emission rate from each method of production. Emissions from the tar sands facilities are very sensitive to these assumptions. For instance, roughly 85% and 77% of the SO_2 emissions for the low and high production cases, respectively, result from the production of steam for in situ recovery. Thus the SO_2 emissions are very sensitive to the fraction of production that is assumed to be by steam flooding (45%) and the SO_2 emission rates from the steam boilers; both of these factors could be much lower than those used in the EIS. Estimates of particulate emissions are equally uncertain since they are predominantly fugitive dust from surface mining and tar sands disposal.

19.14 Particulate Modeling

The method of modeling particulate emissions is very crude and probably only gives an order of magnitude estimate. The EIS estimates the particulate impact of the tar sands projects by a regression formula based on estimates of the present particulate emissions density near regional monitors and present regional monitoring results. Several factors could lead to inaccuracy in the regression formula: (1) present emissions near regional monitors and projected emissions from tar sands facilities are not known well; (2) monitors in towns

19.14 cont. may have been unduly impacted by sources of dust very close to the monitor; (3) dispersive conditions near tar sands facilities may be different from those in regional towns; and (4) much of the fugitive emissions from tar sands facilities may not travel far from mining and disposal sites.

The formula for estimating maximum 24-hour average concentrations would predict exceedances of the PSD Class II increments for any facility emitting over 975 tons per year of particulate. This emission rate is much smaller than that for some large coal mines presently operating in the western U.S.; thus the formula seems conservative.

19.15 Particulate Size Distribution

The EIS states: "Particulate matter below 2 or 3 microns in diameter has an especially long residence time in the atmosphere and penetrates deeply into the lungs." The bulk of the particulate emissions from tar sands however is fugitive dust, the majority of which is larger than 3 microns (Marple, et al., 1980) and relatively harmless compared to the particulate described in the EIS.

19.16 Effects of Gaseous Pollutants

In the EIS, the harmful effects of SO_2 at "only a few parts per million" are described. This concentration, roughly 5000 micrograms per cubic meter, is much higher than the highest SO_2 concentrations predicted in the EIS. This concentration is also higher than the NAAQS for SO_2, which are designed to protect the health of the general public including a measure of safety. The health effects of the other gaseous pollutants which are described in the EIS also occur at much higher concentrations than those which are predicted for the tar sands area.

19.17 VALLEY Model

The near-term impact of point sources was estimated using the VALLEY model. Use of this model probably leads to overpredictions due to the conservative

19.17 cont. nature of the model. The VALLEY model predicts very high concentrations when a plume impacts on elevated terrain. This inpaction is assumed to occur under poor dispersive conditions for six hours in any 24-hour period. Severe over-prediction of ground-level concentrations occur less frequently than assumed in the VALLEY model. Since the model predicts large impacts when plume inpaction occurs, model predictions are very sensitive to source location and source stack parameters. This makes the model results very uncertain for this EIS since all emissions information is hypothetical.

19.18 The authors of the air quality technical report criticize the COMPLX I model because "it employs one wind direction during each hour. In reality, wind direction fluctuates during a given hour, especially in complex terrain. Thus, the constant wind assumption locates the plume centerline improperly relative to the underlying surface." This criticism is equally applicable to the VALLEY model which was used in the report, since the wind direction in that model is assumed to be in the same direction for six hours in a 24-hour period.

19.19 Acid Deposition

The EIS overstates the potential for significant acid deposition due to the tar sands projects. An unrealistically low sulfur deposition rate of 0.5 $g/m^2/yr$ is cited in the EIS as an upper limit to protect sensitive lakes from acidification. Other estimates of acceptable sulfur deposition thresholds are not as low; for instance, a rate of 0.9 to 1.5 $g/m^2/yr$ has been specified as an acceptable loading for the protection of sensitive surface water systems by the Swedish Ministry of Agriculture and Environment (Hilenan, 1983). The final report of the Canada-United States Work Group established under the 1980 Memorandum of Intent stated that areas with sulfur depositions less than 1.7 $g/m^2/yr$ have no recorded damage (Norton, 1983). In addition, the EIS compares the highest predicted sulfur deposition in the region to the threshold value. Most of the area modeled is not as sensitive to acid deposition as the weakly buffered lakes used in developing these threshold values; and, as stated in the EIS, sulfur depositions in any sensitive lakes in the region will probably be smaller than those listed in the EIS.

19.20 NO_2 Modeling

Although not stated in the EIS, it seems likely that NO_2 impacts were estimated by assuming that all NO_x is NO_2. Since most NO_x emissions occur as NO and are only converted to NO_2 over a period of time, modeling all NO_x as NO_2 is a conservative assumption particularly near the tar sands facilities where the largest concentrations are predicted.

REFERENCES

1. Hileman, B., 1983, "1982 Stockholm Conference on Acidification of the Environment," Environmental Science and Technology, Vol. 17, pp. 15-18A.

2. Marple, V., Rubow, K. and Lantto, D., 1980, "Fugitive Dust Study of an Open Pit Coal Mine," Bureau of Mines, Washington, D.C., NTIS PB82 183112.

3. Norton, K.C., 1983, "The Acid Test," Journal of the Air Pollution Control Association, Vol. 33, pp. 398-400.

19.1 The alternative production levels analyzed in this EIS are not unqualified but are based on assumptions and documentation contained in Volume I, Appendix 1. The production scenarios were developed in consultation with industry, academic interests, and other government agencies. According to existing data, the tar sand resource is present within the STSAs. Whether the production levels are realistic or not is largely a function of national and international oil supply economics.

19.2 Three methods of waste sand disposal were presented by industry. These include the disposal of waste sand in mounds, gullies, or tailings ponds. The type of disposal method employed would depend upon the recovery method used and the topography of the land surrounding the processing plant. The method of disposal would need to be analyzed when plans of operations were submitted.

19.3 Depending on location, pipelines could have different but perhaps greater impacts than existing transportation routes because of surface disturbance. Also, refer to Letter Response 2.17.

19.4 Mining and processing are, as stated, energy efficient operations. All factors were considered as part of the overall energy efficiency. Some of these factors included ore left in the mine which could not be recovered, energy to mine, milling processes, and transportion. Infrastructure energy needs are included as part of the standard analysis so that different projects could be compared on a equal basis. A chart showing efficiency from other energy sources has been added to Volume I, Chapter 1, Energy Efficiency section.

19.5 The purpose of this EIS is to identify impacts to water resources according to the production scenarios on a regional level. Impacts to specific streams would need to be analyzed by a site-specific EA or EIS as plans of operations were submitted. While recognizing that water quality could be adversely impacted by accidental occurrences, BLM's assumptions are that responsible practices and adherence to applicable laws would occur during tar sand development. Given the high commercial production alternative, it was considered appropriate to determine increased salinity costs to the Colorado River. This was calculated by use of the Colorado River Simulation System Model, a computerized simulation model that contains all the "Laws of the River" (see Volume I, Appendix 3).

19.6 Assuming the worst-case situation, a total of 88,295 acre-feet of water per year would be required for tar sand development under the high commercial production alternative. A depletion of this magnitude from the 18 rivers and streams listed in Volume I, Tables 3-13 and 3-14 could result in total elimination of some fisheries, especially those located in smaller streams and rivers where large depletions would occur.

19.7 Volume I, Summary of this Final EIS has been amended to reflect the comments concerning significant effects on actual acres disturbed and the effects being minimized through the EA or EIS process and reclamation.

19.8 Refer to Letter Response 14.26.

19.9 Refer to Letter Responses 14.29 and 18.69.

19.10 The screening models used in this analysis have been validated for isolated sources in rural areas having complex terrain, using best available production estimates known at this time. If the actual recoverable resource were developed, the PSD permitting process would determine the scale of production under NAAQS. The air quality assessment in this EIS is made to satisfy NEPA and current CEQ requirements, rather than to support PSD permit applications. Sufficient data are now available on dispersion climatology, terrain, ambient air quality, and projected emissions to formulate a regional overview. For analysis purposes, processing plants were assumed to be located away from high terrain whenever possible in order to avoid high plume concentrations.

19.11 The VALLEY-BID and other models used are considered the best tools for preliminary impact analysis (Aerocomp, Inc., 1983a). The screening methods used in this EIS have been validated for isolated sources in rural areas with complex terrain. Also, refer to Letter Response 2.19.

19.12 Under PSD regulations, modeling would be used to demonstrate that emissions from a proposed new source would not cause pollutant concentrations to exceed either the increment levels or NAAQS. However, the analysis in this EIS predicts that, under present industry practices and the projected production estimates, violations to air quality standards would occur unless additional air quality control measures were included.

19.13 Lease conversion applicants and BLM mineral specialists determined whether surface or in-situ methods would be used, based primarily on overburden thickness. For in-situ operations, hot water extraction was assumed unless another method was specifically proposed. Thus, steam flooding was assumed only when indicated by the lease conversion applicant. Energy requirements of the steam flooding process were obtained from "Technology Assessment: Environmental, Health, and Safety Impacts Associated with Oil Recovery from U.S. Tar-Sand Deposits" (Lawrence Livermore National Laboratory, 1981).

Aerocomp, Inc.'s (1983a) particulate emission rates are based on surface coal mining processes that resemble those planned in a typical tar sand operation. These estimates compare favorably with those of Mono Power Company (1983) for its proposed 30,000 BLD commercial project. Specifically, Mono Power estimated 5,759 tons/-year of controlled particulate emissions from its commercial mine, while Aerocomp, Inc., calculated 5,612 tons/year--a difference of less than 5 percent.

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19.14 Many factors were considered before the regression formula was adopted. Initially, the relationship between emission density and ambient particulate concentrations was analyzed. The correlation between these two parameters was good ($r = 0.89$ for the annual and $r = 0.70$ for the 24-hour TSP concentrations). This relationship essentially provided a calibrated model for fugitive particulate emissions.

The scope of the problem also encouraged the use of the regression techniques. Essentially the entire eastern half of Utah had to be considered in the treatment of fugitive dust, and this is beyond the range of VALLEY. Another factor in favor of the regression approach was consideration of deposition. The dispersion models used do not treat deposition; however, deposition is built into the regression equation.

Uncertainties in the facility types, location, and emissions discouraged the use of dispersion models to treat area sources. For instance, location of the pollutant source can have a dramatic effect on air quality. Locating a facility on high terrain may result in no impacts, while the same facility on a valley floor may have significant impacts. After considering all these factors, it was found appropriate to adopt the generalized approach of the regression formula.

Also, refer to Letter Response 2.19.

19.15 Human health effects of particulate matter are determined by their mass concentration and chemical composition, as well as size distribution. Coarse particulates would be more likely to be filtered by the nose and mouth, whereas fine particulates would tend to penetrate into the lungs. Fugitive dust produces coarse particulates; however, stack emissions from tar sand upgrading facilities would produce fine particulate matter below 2 or 3 microns in diameter.

19.16 Refer to Letter Response 18.21.

19.17 The VALLEY and other models are sensitive as to source location and stack parameters. In locating sources for modeling purposes, efforts were made to locate processing plants away from high terrain whenever feasible to avoid high plume concentrations. As with any mathematical modeling, some uncertainty with the results can be expected. Also, refer to Letter Response 15.13.

19.18 The Final EIS air quality technical report (Aerocomp, Inc., 1984) has been amended to reflect this information.

19.19 Researchers are only beginning to understand the complex interaction of precipitation, geology, and vegetation that predisposes lakes to acidification. It is known that winds can transport SO_x and other acid-formulating pollutants at distances of 1,000 km (620 miles) (Electric Power Research Institute, 1983).

This EIS has documented the deposition rate of 0.5 $g/m^2/yr$. from Colorado because it is an example within the regional airsheds of the tar sand project area (Oppenheimer, 1982). This value has

also been documented from similar studies in Europe (Swedish Ministry of Agriculture, 1982) and eastern North America (U.S./Canada Working Group on Impact Assessment, 1981). The uncertainties of the environmental consequences of acid deposition have been so stated in Volume I, Chapter 4, Alternative 1 (Regional Overview), Air Quality section.

19.20 This assumption is one that is often made in air quality impact assessments (see the Uintah Basin Synfuels Development Final EIS [USDI, BLM, 1983g]). A statement clarifying this assumption is included in the Final EIS air quality technical report prepared by Aerocomp, Inc. (1984).

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January 18, 1984

Roland Robinson, State Director
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Dear Mr. Robinson,

We would like to preface our comments on the Utah Combined Hydrocarbon Regional Draft EIS by saying that we do not think the tar sands resource needs to be developed. Tar sands, like other hydrocarbon resources, are of limited supply. No matter how good our production and refinement techniques, we will eventually use up the resource and degrade the environment at the same time. Instead, our efforts should be toward conserving the hydrocarbon resource we do still have and developing renewable sources of energy for the future. This is especially true for tar sands whose technology and economics are as unknown and uncertain as for many renewable energy technologies.

These comments are in four sections. The first section applies to the entire tar sands leaseconversion process. The last three sections correspond to the three volumes of the draft EIS.

20.1 The DEIS should contain a more thorough description of the entire lease conversion process and the purpose of the associated environmental analyses. As was shown by the numerous questions at the Salt Lake City meeting, in no one place does the DEIS completely describe the process. The following questions ought to be answered in the final EIS, preferably in one coherent section. Do leases have to be converted? What if leases are not converted? At what stage in the process is the lease actually converted? For how many years does a combined hydrocarbon lease remain in effect? What must be done in order to maintain that lease? Where and how many plans of operation have been submitted? Are leasing category amendments fixed upon approval of the final EIS?

20.2 One of the most important questions raised during the Salt Lake City meeting was essentially, what constitutes an acceptable plan of operations? The Combined Hydrocarbon Leasing Act clearly specifies the plan of operations "assures reasonable protection of the environment and diligent development of those resources" ((8)(k)(1)(A)). However, judging by the information contained in the Sunnyside DEIS, neither of these objectives has been met. AMOCO's plans for a pilot plant are sketchy at best. While the Chevron-CNC plan may contain enough information to assess the environmental impacts of the pilot processing plant, little is known about the commercial phase. ENERCOM's plans are vague and they have "not committed to implementing any special mitigation measures" (p.1-34). While the conversion regulations do allow for

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20.2 cont. changes in the plans of operations, the plans are presently inadequate to accurately assess the environmental impacts which might be caused by approving the lease conversations and subsequent development of the tar sands. On these grounds it would make sense not to approve the lease conversions until the proposed actions have been more laid out and the actual impacts more clearly analyzed. Postponed conversion may, however, be illegal--the November 15, 1983 deadline for the submittal of an acceptable plan of operations has already expired.

We do, however, realize that the inability of these five companies to develop an acceptable plan of operations is largely due to the lack of technological knowledge. It would be difficult for the BLM to deny conversion on these grounds. However, the more than 20 plans of operation which were submitted just prior to the November 15 deadline may be unacceptable and these lease conversion applications should not be approved based on the "lack of technical data" rationale. While some plans of operation may demonstrate a good faith effort at diligent development of the tar sands resource, others may have been submitted in order to inexpensively extend the terms of the lease. An oil and gas lease in an STSA which was due to expire today could be extended by about eleven years, avoiding competitive leasing, simply by submitting a plan of operations. With this in mind, the BLM ought to seriously consider not approving an application where the intent may be to circumvent the competitive leasing process.

Volume I:
Volume I of the Regional Tar Sands DEIS is by necessity, extremely general in nature. Without having any specific plans of operation to work by, the BLM has, with a few exceptions, done a good job at looking at the potential environmental impacts of lease conversion and subsequent development. However, because the DEIS is so general, we think it is imperative that any tar sands development be preceded by a site specific environmental impact statement. Where site specific EIS's have been prepared based on plans of operation that are only conceptual (such as the Sunnyside Tar Sands DEIS) a further EIS will be needed so that the real environmental impacts of tar sands development can be analyzed and presented to the public for comment.

20.3 One of the inadequacies of volume I of the DEIS is the assessment of the number of acres of wildlife habitat lost due to development. While the number of acres physically impacted in each scenario may be correct, many more acres of wildlife habitat could be lost because wildlife may be unwilling to live amidst development. This is particularly true in the case of in-situ mining. Though only 30-60% of the land would be physically disturbed (v.I, p. 21), wildlife probably would not utilize the undisturbed land between closely spaced wells. The acres of habitat lost should include this potential.

20.4 The need for this type of assessment for bighorn sheep habitat is essential. The DEIS notes that mining of tar sands would have an exclusionary effect on bighorn sheep because they are so sensitive to human encroachment (v.I, p.111, v.II, p.64). In an area like the San Rafael STSA, where in-situ mining is expected, bighorn habitat loss will be much more than the physically impacted acres. A more realistic estimate which includes habitat lost but not affected should be included in the DEIS. In addition, the number of bighorn and any planned reintroduction programs which may be affected by tar sands development should be discussed.

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20.5 The DEIS does not discuss potential impacts to proposed threatened and endangered species. Though volume I explicitly states "thes species will be considered on a project-by-project basis as each plan of operation isreviewed for approval" (p. 94) no such consideration was given in the Sunnyside DEIS. We feel that the impacts to proposed T&E species ought to be discussed on an equal basis with listed T&E species, especially since leasees are required to submit a plan of operations which will protect both listed and proposed species. Such a discussion ought to be included in this EIS.

20.6 Our final complaint concerning volume I is that it lacks a coherant discussion of reclamation. While it may be difficult to adequately discuss reclamation without any actual plans for development, something more comprehensive is needed than the piecemeal discussion or reclamation that exists.

As a whole, we find the environmental impacts of large scale tar sands development to be completely unacceptable.

20.7 Volume II:
Volume II: leasing category amendments is the most important part of the DEIS because it will have the most direct effect on actual tar sands development. Nevertheless, it is also the most inadequate part of the DEIS: it is inconsistent, does not take into account various resource protection issues and where it does, it provides inadequate protection. Further leasing category amendments and stipulations must be allowed for in subsequent site specific environmental impact statements.

20.8 The lease conversion regulations say that once a lease conversion is approved, a new lease will be issued with the previous oil and gas lease stipulations "as well as any additional stipulations, such as those required to ensure compliance with the plan of operations" 3140.1-2(a). However, because the plans of operation had not been submitted prior to the writing of volume II, a further EIS which contains additional stipulations, as necessary, based on the plan of operations is needed. In the case of the Sunnyside DEIS yet a further EIS is needed so that resource protection stipulations can be added once a detailed plan of operations has been submitted.

20.9 None of the leasing category amendments provide any protection for proposed T&E species. Though these species need special protection the BLM appears to know nothing about their habitat. Information on candidte species habitat must be collected and special stipulations added to protect thes species.

20.10 Special stipulations are applied inconsistently in the DEIS. The section for Sunnyside STSA (couchers) incorporates many special stipulations such as no occupancy on slopes of greater than 50%, requirements for hydrologic investigations, and time of year restrictions for using important wildlife habitat. The cirle cliffs section contains a no surface mining and a conventional methods only stipulation. Vernal district employs special stipulations to ensure that cultural and paleontological resources are inventoried and protected and that listed and proposed T&E species are studied prior to disturbance. Clearly, these (as well as stipulations in the up coming Henry Mountains MFP and Book Cliffs RMP) stipulations need to be applied more consistently. We feel that some of these stipulations are important for all lands. Even if the tar sands are to be developed, unless

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20.10 cont. and unnecessary degradation of the environment is not allowed. Water is such an important resource that a complete hydrologic investigation should occur prior to any development. Sedimentation is such a severe problem that occupancy on slopes greater than 50% should be allowed nowhere. Cultural and paleontological resources should always be inventoried as should listed and proposed T&E species.

Unfortunately, these stipulations do not go far enough. Severe erosion can occur on 30 and 40% slopes. Prohibiting exploration activity of crucial range during the appropriate time of the year only preserves that range for one additional year--after that it will be destroyed and it doesn't matter if exploration occurs. The same is true for sage grouse strutting and nesting grounds.

20.11 There is also problems with the leasing categories. How could the BLM possibly pick a preferred alternative that is less restrictive than the no action alternative for the San Rafael Swell STSA? Tar sands development will most certainly be more harmful than oil and gas development. To place fewer restrictions on the combined hydrocarbon leases than the previous oil and gas leases seems unsensible.

20.12 The BLM has correctly pointed out that no wilderness study areas that are designated as wilderness will be developed for tar sands (unless it can be done without impairment). However, even if a WSA is not designated wilderness, it is important to protect these areas with admittedly outstanding opportunities. Even the restricted development alternative places parts of the Mexican Mountain WSA, which the BLM found suitable for wilderness, in category 1. The restricted development alternative for the circle cliffs STSA allows unrestricted development immediately adjacent to Capitol Reef National Park. Clearly the "restrictive development" alternative is by no means a resource protection alternative.

20.13 In order to assure that this volume of the EIS considers the complete range of alternatives a "resource protection" alternative is needed. This alternative should require at least some type of hydrologic, c ultural, paleontological, and wildlife evaluation/inventory prior to development with the ability to postpone, redesign, or prohibit a project if an important resource will be lost. Restricted development on excessive slopes should be a standard stipulation. Development should not be visible (category 3) from the National Parks and Recreation Area or other important recreational areas such as Desolation Canyon, Escalante Canyons, Dark Canyon, and the Dirty Devil River. Wilderness study areas, especially those that have been found preliminarily suitable, should be placed in category 3 because they have already been recognized as an important resource. Stipulations for proposed T&E species should be included. Other identified wildlife habitat ought to be more fully protected. Only with these restrictions would there be an alternative that allows for considerable tar sands development and would adequately protect many important resources.

Volume III:
The BLM preferred alternative is a reasonable alternative. It is important to recognize leasing for conventional oil and gas within the STSA's. Given the limited technical knowledge about tar sands development it will be interesting to see if anyone is interested in a competitive lease. If few are interested, then even less acreage should be considered in subsequent years so that there remains some competition for the leases. Though this volume of the EIS analyzes

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the environmental impacts of development of these tracts, another EIS will be necessary once a plan of operations has been submitted for each of the individual areas.

Sincerely,

Brian Kamm

Brian Kamm
Natural Resource Intern

20.1 Refer to General Response 3.
The BLM Utah State Office has received 41 applications to convert oil and gas leases to CHLs. Applications were not received for White Canyon or Argyle Canyon/Willow Creek STSAs.

20.2 Refer to Oral Testimony Response 8.

20.3 Well spacing could vary considerably between and within STSAs. This impact, along with indirect impacts, could affect wildlife populations or habitats. Volume I, Chapter 4, Animal Life sections in this Final EIS, has been amended to include indirect impacts to wildlife.

20.4 Indirect impacts from in-situ mining could seriously affect bighorn sheep populations in an area like the San Rafael Swell STSA. A statement regarding indirect impacts (i.e., nonsurface-disturbing impacts) to wildlife populations (bighorn sheep included) appears on Volume I, Animal Life section, page 110 of the Draft EIS. In regard to reintroduction programs, the document states that, "Because these species (bighorn sheep) are extremely sensitive to human encroachment, loss of this habitat, especially lambing and rutting grounds and water sources, could reduce or eliminate existing bighorn populations as well as prevent or retard the success of planned reintroduction programs." Because there is no way of determining the exact effect of indirect impacts to bighorn sheep populations, only those impacts associated with the direct loss of habitat are discussed in detail.

20.5 Refer to Letter Response 17.10. The Sunnyside Combined Hydrocarbon Lease Conversion Draft EIS, page 3-38, Section 3.A.4, Wildlife, and especially Appendix A-8 provides the mandated consultation process which has been initiated for Endangered Species Act compliance.

20.6 An expanded discussion of reclamation would have to be site-specific and in response to a completed plan of operations to be meaningful. The stipulations and guidelines given in Volume I, Appendix 2 of this Final EIS outline the steps that would be taken to ensure adequate reclamation of disturbed sites. Also, refer to Letter Responses 15.32 and 15.36.

20.7 Future modification of stipulations, if determined appropriate by BLM, could be done on individual plans of operations and would be based on the best available information.

20.8 Site-specific environmental analyses will be completed, where appropriate, as detailed plans of operations are submitted. The decision as to whether or not these plans of operations for new lease areas would constitute a major action requiring an EIS has yet to be made. Site-specific EISs are in progress or will be prepared for lease conversion applications at Sunnyside and Vicinity (Southern Portion), Tar Sand Triangle, P.R. Spring, and Circle Cliffs STSAs.

Response Letter 20

20.9 Refer to Letter Response 17.10.

20.10 The leasing categories have been based on what is presently known about the resource base in the various STSAs. These categories are not consistent between STSAs because the makeup of the resource base varies from one area to another and each involves different protection. Refer to Letter Response 20.7.

20.11 Refer to Letter Response 18.43.

20.12 There are portions of present WSAs that could be disrupted by tar sand development if the area is not designated wilderness. In most cases, the alternatives (multiple use and restricted development) recognize outstanding wilderness values and propose stipulations/categories to protect areas with outstanding wilderness values. Mexican Mountain WSA is one example. Over 10,000 acres, constituting the area with greatest scenic and primitive recreation values, would be protected by category 3 and 4 classifications.
The restricted development (resource protection) alternative for the Circle Cliffs STSA would allow tar sand development in areas immediately adjacent to Capitol Reef National Park. Some of these are potential surface mining areas and thus development, as stated in Volume II, page 121 of the Draft EIS, would probably irreparably alter existing topographic features and possibly require long periods for revegetation (which might not be successful).

20.13 Volume II analyzes alternative leasing categories and stipulations. It is in this volume that resource protection alternatives for specific STSA tar sand leasing/lease conversion categories are analyzed. Refer to Volume II, Development of Alternatives for STSAs section, page 10 of the Draft EIS for a discussion of alternative development.

Comment Letter 21

THE HUMANE SOCIETY OF UTAH

4613 South 4000 West
P.O. Box 20222
Salt Lake City, Utah 84120
Phone 968-3548

January 14, 1984

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear State Director,

We appreciate the opportunity to review the Utah Combined Hydrocarbon Regional Draft EIS, Volumes 1, 2 and 3. We have several concerns about the information presented:

21.1 1. Important information has been left out concerning affects of Development upon a multitude of non-game species of small mammals, reptiles, amphibians and non-game birds. Many of these groups are of great interest to Utahn's and are easily upset by changes in their environment.

21.2 2. A major area of concern is the destruction of wildlife species by oil and gas, as well as tar sand, employees while traveling through public land areas. This problem should be addressed & stipulations created to prohibit the carrying of firearms in public lands areas by these employees.

21.3 3. Assumptions that Big Game species are evenly distributed in their seasonal ranges are not valid and make such related comparisons impractical for use.

4. All listed alternatives are unacceptable to HSUS due to their massive affects and loss of habitat and life to affected species. As long as monetary return upon investment is a major aspect of making decisions such as these, animals and habitat will suffer unreasonably and inhumanely.

We appreciate the opportunity to comment on this Draft EIS.

Sincerely,

John Paul Fox
Chief Investigator

DEDICATED TO THE ELIMINATION OF FEAR, PAIN AND SUFFERING OF ALL ANIMALS

Gifts and Bequests to the Society are deductible for income and estate tax purposes.

Response Letter 21

21.1 Refer to Letter Response 14.21.

21.2 Refer to Letter Comment and Response 12.2.

21.3 Refer to Letter Response 14.24.

Comment Letter 22

16 January, 1984

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Director:

22.1 I have several comments in response to the draft EIS for tar sands development in Utah.

The large scale development of tar sands in Utah may be inevitable, and has in fact begun on a small scale. While minimum standars for air and water pollution resulting from development would be set by the federal government, other types of activities would not be so closely regulated. These include the amount of area to be disturbed by mining, resultant soil erosion, revegetation, and others. Since tar sands are unique to Utah and a few other states, it is unlikely that Congress will enact legislation to regulate their mining and development, or their reclamation. Thus it is imperative that the State of Utah, or more specifically the Division of Oil, Gas, and Mining, do so before development exsands.

Even after regulations are formulated, there will still be some areas which are adversely impacted. I refer to any development in the vicinity of national parks, wilderness areas (potential), or any areas which are set aside for preservation of animal and plant resources, as well as for scenic beauty. The one area I know of which fits this description is the Tar Sands Triangle. Air pollutants could affect Canyonlands National Park, and development would directly interfere with Glen Canyon National Recreation Area. While the legal definition of a Recreation Area does not pgclude mineral or other development, use by the public would be restricted. Air and water pollutants and wind erosion could affect some heavily used areas, as well as reducing the pristine nature of the area.

22.2 Another concern in the draft EIS is the short shrift given to groundwater. In situ mining may cause especially large quantities of organic and inorganic substances to leach into the groundwater. The EIS states that groundwater movement is slow. However, sandy substrata, such as these in question, would be porous and have high hydraulic conductivity. Contamination of major aquifers and rivers is a real possibility. As stated, the in situ method is still technologically infeasible. Research should include testing for groundwater contamination.

22.3 Surface mining of tar sands may be economically feasible in the near future, but should be practised with the above stipulations; regulations should be legislated, and lands preserved for other purposes should be avoided. In situ mining is still questionable.

Thank you for this opportunity to have some input on Utah's future.

Sincerely,

Edith M. Allen
247 E 600 N
Logan, Utah 84321

94

Response Letter 22

22.1 Tar sand development activities on BLM and Glen Canyon NRA lands would be regulated by the general standards and special stipulations of the applicable Federal leasing category (see Volume I, Appendix 2 and Volume III, Appendix 2). However, development on State or private property would not be subject to those stipulations. In either case, there would be, as indicated in the comment, impacts on adjacent NPS and potential wilderness area lands.

22.2 Volume I, Table 3-6 contains a brief summary of available groundwater data for the 11 STSAs; groundwater discussions are found for the STSAs in Volume II. Impacts to groundwater are discussed in Volume II, Appendix 1, Legal Water Source Stipulations section and include the items mentioned. Also, refer to Letter Responses 7.1 and 14.60.

22.3 Surface mining may be economically feasible in the near future. At the present time, pilot in-situ recovery projects are operating in Texas and Alabama. The same type of technology could be applied to the subject STSAs in Utah. Further testing will, however, be required to determine reserve availability details and the economic feasibility of extracting hydrocarbons from the STSAs included in this EIS.

Comment Letter 23

ARCHES NTL. PARK by Karen Tweedt

SIERRA CLUB **Utah Chapter**

63-B Elizabeth St., #4
Salt Lake City, UT 84102

14 January 1984

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, UT 84111

Dear Sir:

Following, at random and in haste, are some of the Utah Chapter of the Sierra Club's comments on the Utah Combined Hydrocarbon Regional Draft EIS.

Even the limited, incomplete information available in the DEIS shows that the impacts of tar sand development, even at the "Restricted Development" or Resource Protection" levels, would be extremely serious and, in some areas, devastating. For such damage to occur from extraction of an unneeded resource by an unproven technology, is pure folly.

23.1 Why, in Volume II of the DEIS, is "Multiple Use" consistently the preferred alternative? And why is this alternative called "Multiple Use"? If one of the proposed alternatives must be chosen for each SUSA, the "Restricted Development" or "Resource Protection" alternative should be preferred, given the inadequacy of available information, the uncertainty of the technologies involved, and the inevitably serious environmental damage which would occur as a result of any development.

23.2 Is there really any necessity to offer any unleased areas for new hydrocarbon lease sales?

Has BLM considered letting leases lapse, and putting them back on the market later for competitive bidding? Or extending the leases without the development?

Comment Letter 23

23.3 With regard to Volume III (Potential Lease Tract Analyses), why does BLM prefer Alternative 4 rather than holding off on leasing for a year or so and recommending the "No Action" alternative?

23.4 The Combined Hydrocarbon Leasing Act requires an acceptable or complete Plan of Operations prior to development. Has BLM determined what constitutes an acceptable plan of operations? Are there standards for accepting a plan? The Act requires a plan of operations assuring "reasonable protection of the environment. . ." Do the uncertainty and unproven nature of tar sand technology assure protection of the environment? Will the public have any opportunity to review plans of operation?

23.5 What sanctions can/will be imposed upon developers who do not abide by the general and special stipulations?

23.6 The impacts of high commercial production (Alternative 1 in Volume I) on the human and natural environments are unthinkable. Even the low production scenario would have enormous negative impacts on the land and the population. And even BLM admits there are still a number of unresolved issues that still must be dealt with. A preferred alternative should be "No Action" at this time.

There are too many unanswered questions regarding tar sand technologies and their potential impacts; we must answer these questions, learn much more than we now know, before we commit ourselves to major leasing. There is not enough information available to allow us to make viable decisions right now. The concerns the Sierra Club has are serious ones. They are not limited to the SUSAs near National Park areas and Wilderness Study Areas, although of course those places are very special.

A lot of work has gone into the preparation of the draft EIS. We appreciate that work and the opportunity to comment on the documents. We will submit more detailed comments on the draft EISs on the specific SUSAs.

Sincerely,

Ruth A. Frear

Ruth A. Frear

Response Letter 23

23.1 The multiple-use alternative in Volume II is BLM's preferred alternative at this time. It is called multiple use because it is the alternative in which a balance of uses was considered and no one resource consistently received preference over another.

23.2 As indicated in the introduction to Volume III, BLM is responding to Congressional mandates found in the Combined Hydrocarbon Leasing Act of 1981. That Act was initiated "to facilitate and encourage production of oil from tar sand." It allows combined hydrocarbon leasing in STSAs.

There have been Expressions of Interest from industries which were used to help identify the potential lease tracts for the first competitive sale. The date of that sale was originally planned for May 1984, but that sale date has now been delayed.

If and when a CHL is issued, the lessee will obtain specified rights to the resource. As long as a leaseholder performs in accordance with the provisions of the lease, development and renewal are his prerogative. BLM does not have the authority to let a lease expire.

23.3 The Combined Hydrocarbon Leasing Act was enacted in 1981 "to facilitate and encourage the production of oil from tar sand" while providing reasonable protection of the environment.

All of the alternatives, including no action, are viable options to the decision-maker. Because it provided reasonable protection of the environment, BLM preferred Alternative 4. See Volume III, Appendix 3.

23.4 There are general standards for acceptable or complete plans of operations. Where appropriate, an EA or EIS will be completed on a site-specific plan of operations to identify reasonable protection of the environment and facilitate public review. Questions concerning tar sand technology will continue indefinately as the industry continues with research and development. Also, refer to General Response 1.

23.5 On-the-ground monitoring will be conducted by an authorized officer of the BLM to ensure compliance with lease stipulations. In the event that the terms and conditions of the lease are not met, a notice of noncompliance may be issued or action may be taken against the bond.

23.6 The purpose of the Regional EIS is to show cumulative impacts from analysis of tar sand development. Several production levels are addressed, including the high commercial production, which BLM considers to be maximum or worst case. This would occur if all proposed projects were implemented at the same time. The Regional EIS also identifies areas where assumptions were used in place of data not available. There will be no decision made concerning production goals or preferred levels based only on the regional analysis contained in Volume I.

Comment Letter 24

Mono Power Company
P. O. BOX 600
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

January 18, 1984

HAND DELIVERED

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Gentlemen:

24.1 Mono Power Company has completed a review of both the Utah Combined Hydrocarbon Regional Draft EIS ("Regional DEIS"), the Sunnyside Combined Hydrocarbon Lease Conversion Draft EIS ("Sunnyside DEIS") and the Planning Amendment to the Price River Management Framework Plan ("Price River MFP"). It is our understanding that the BLM's intentions, in preparing the two DEIS's, was to make them consistent with each other by using the BLM's land-use policies as contained within the Price River MFP.

Our review of these documents suggests that they are not only inconsistent with one another in forecasting or describing potential development levels and environmental disturbance but that they are also inconsistent with the Price River MFP in describing possible development controlling stipulations. Specific examples of these inconsistencies are as follows:

Land-Use Disturbance Projections

24.2 Throughout the Regional and Sunnyside DEIS's, the BLM has made projections as to the number of project-related acres of disturbance. These projections of disturbance of land are not in agreement among the documents. Inasmuch as these DEIS's will, in their final form, become significant decision-making tools, we feel as though it is necessary for the disturbance estimates to be consistent in both of the documents which address the same projects and the same geographic areas.

Comment Letter 24

24.3 Environmental Impact Analysis

The significance of impacts to the environment as reported in one DEIS is likewise inconsistent with those of the other. For example, the projected impacts upon threatened and endangered species, visual resources, soils and vegetation vary significantly suggesting that inconsistent analysis techniques were utilized and that not enough reliable data was, or is available to accurately forecast the disturbances projected authoritatively in the two DEIS's.

24.4 Baseline Data

Throughout the two documents, different sets of data were developed to be used as an initial baseline for the purpose of measuring the impacts associated with the potential tar sand industry. These two independently developed and exclusive baseline data sets are very confusing and warrant further attention and clarification. It is recommended that both SIS project teams agree upon one baseline data set for use in comparing potential tar sand related disturbances.

Mitigation Stipulations

24.5 In both documents, specific, though inconsistent, mitigation stipulations are presented as those which would, of necessity, be imposed, in the form of lease stipulations, on future projects. The inconsistency of these stipulations is exemplified by those stipulations dealing with wildlife habitat which become unrecognizable as one tries to trace the same stipulations from the Price River MFP through the Regional DEIS to the Sunnyside DEIS. Indeed, the ability to mitigate wildlife disturbance is limited by the BLM and finally eliminated as one progresses through the three documents. It is necessary to maintain mitigation capability, under the BLM's approval, throughout the stipulation discussions in the two DEIS's.

Resource Management Policies

24.6 Another major concern centers around the protection of public water resources and supplies. In many sections within the Regional DEIS, protection is provided by the complete exclusion of tar sands development, thus precluding mitigation by the development of other water sources which might, in fact, not only

Comment Letter 24

24.6 cont. protect the communities' existing supplies but also improve the quality of the water currently being used. Further, the attitude of "protection-by-exclusion" tends to contradict not only the best interests of the local communities but also the laws and regulations under which certain watersheds and supplies were established. In dealing with this matter, we suggest that disturbance be allowed in areas of significant water resources providing that the disturbance associated with the water resources can be successfully mitigated.

In conclusion, we are concerned that the two DEIS's be consistent with one another in determining impacts and that they be consistent not only with each other but also with the Price River MFP in dealing with lease stipulations and allowing for mitigation of disturbance in areas of special environmental concern. The following attachment itemizes specific comments as they relate to the Regional DEIS. Each comment is keyed to the Regional DEIS by reference to Volume, Page, Column, and Paragraph. This was done to assist the reviewer in locating the specific areas addressed.

Should you have any questions regarding any of the above or subsequent comments, please feel free to contact me at (213) 572-2752.

Sincerely,

Wayne R. Gould
Project Manager, Tar Sand

0984h

Comment Letter 24

SPECIFIC COMMENTS
RELATING TO THE UTAH COMBINED
HYDROCARBON REGIONAL DRAFT EIS

The following comments relate to the Utah Combined Hydrocarbon Regional Draft EIS ("Regional DEIS"). To assure that the comments can be referenced to the Regional DEIS document, a comment numbering system has been developed. The system designates volume, page, column and paragraph. For example, "II, 66, 2, 9" refers to Volume II, page 66, column 2, paragraph 9 in the document. A written statement follows each comment number.

24.7 II,2,1,6 -- One of the Major Issues identified for the Sunnyside STSA is the potential disruption of underground aquifers. What is the basis for that projection? It is our understanding that the potential projects will be located near the recharge area for aquifers and will disturb only a small amount of the total area, and that following mining, the aquifer recharge rates will return to pre-mining levels. In the complete absence of supportive data, it is suggested that the disruption of aquifers not be listed as a Major Issue for the Sunnyside STSA.

24.8 II,66,2,9 -- Under the Alternative 1, no leasing is allowed in the Sunnyside Water Supply Reserve. What is the basis for excluding development from that Reserve inasmuch as PL-294 allows for the development of mineral resources providing that the Secretary of the Interior finds that minerals can be developed "without injury to the municipal water supply of Sunnyside, Utah." Because mitigation of impacts to the Sunnyside water supply is allowed by PL-294, it should also be allowed in considerations of tar sands leasing.

24.9 II,68,1,4 -- Under Alternative 2, the statement is made that "the highest value tar sand deposits were placed in the open category, regardless of the potential impacts to wildlife, watershed, vegetation, and suspected aquifers." This is simply not true. The Regional DEIS adds stipulations to this alternative which severely limit leasing. For example, the Sunnyside Water Supply Reserve is placed in a no surface occupancy category and a no leasing category. No mitigation of impacts (as allowed by PL-294) is taken into account. It is requested that the capability of mitigation be incorporated into the Final Regional EIS.

24.10 In addition to the arbitrary exclusion of water reserves, golden eagle nests are also given category 3 classification denying the mitigation capability provided for under Federal law, which allows nests to be moved under agreements with the U. S. Fish and Wildlife Service. Mitigation of this nature should also allowed in the Final Regional EIS.

Comment Letter 24

24.10 cont. If the intent of the BLM is indeed to allow the highest value tar sand deposits to be developed with proper environmental protection, mitigation of sensitive issues should not be precluded but should be allowed and incorporated into the Final Regional EIS.

24.11 II,68,2,5 -- The category 2 stipulations related to sage grouse habitat protection are unclear. Do they only apply to oil and gas recovery? If not, they must be rewritten to address tar sands recovery.

24.12 II,71,1,2 -- The requirement that no more than 25% of a lease area be disturbed or be in partial reclamation at any one time is arbitrary. What is the basis for the 25% threshold? Open pit mining calls for the largest portion of the total disturbance early in the life of a project. For example the initial pit must be developed before backfilling can begin, the waste rock must be disposed of, and project roads and support facilities must be built. It is possible that for a given property and mine plan that an excess of 25% could be disturbed early on.

It is recommended that the 25% threshold be deleted and be replaced wih a requirement for reclamation to be contemporaneous with mining to the extent practical. This will minimize disturbance and allow operational flexibility.

24.13 II,71,1,5 -- What is the basis for requiring complete containment of runoff water, mine waste, sediment, or any other potential contaminant? Complete containment is unreasonable. For example, runoff water is required to be treated to remove suspended solids as part of an NPDES permit. When released, the water is cleaner than undisturbed storm runoff from natural drainages. Complete containment would remove water from the basin system and serve no purpose in protecting the Sunnyside Water Supply Reserve.

24.14 Likewise, complete containment of any potential contaminant or any type of discharge is unreasonable. For example, 100% reduction in fugitive dust is operationally impossible.

The Final Regional EIS should be changed to incorporate effluent limitations consistent with existing Federal laws.

II,71,2,1 -- No mitigation of impacts to Public Water Reserves, wildlife habitat or golden eagle nests is allowed. Existing laws set up to manage these resources allow for mitigation under the direction and approval of appropriate agencies, and the EIS should also allow for mitigation. It is recommended that all stipulations allow exceptions as "specifically authorized" by the appropriate agency.

24.15 II,74,1,4 -- The stipulations prohibiting disturbances to wildlife habitat during certain times of the year are inconsistent within and among the Regional DEIS, the Sunnyside DEIS, and the proposed amendents to the Price River Area Management Framework Plan. (Please see Table #1 entitled Exploration and Development Prohibitions.) They are also difficult to follow because they are presented in different ways. They should be clearly presented in a consistent fashion. Mitigation and flexibility should be allowed for by the BLM.

TABLE # 1
EXPLORATION AND DEVELOPMENT PROHIBITIONS

Habitat	REGIONAL DEIS	SUNNYSIDE DEIS	PRICE RIVER MFP
1. Sage Grouse	Apr.-June (p.68) Apr.- Mid June (p.71)	Apr.- Mid June (p.4-3)	Apr.- Mid June (p.50)
2. Deer Winter Range	(Nov.- Mid May (p.4-3)	Nov.- Mid May (p.73)	Nov.- Mid May (p.52)
3. Calving and Fawning		Mid May- Mid July (p.4-3)	
4. Deer Summer Range	Mid May- Mid July (p.74) Mid May- Oct. (p.74)	Mid May- Nov. (p.4-3)	Mid May- Mid July (p.54)

24.16 II,74,2,1 -- What is the basis for the statement that Alternative 4 "does not exclude tar sand development."? Was consideration given to location of resource? Was any consideration given to quality of resource allowed or constrained? The category 3 and 4 stipulations if applied with no mitigation will remove large blocks of high quality resource from consideration.

24.17 II,85,2,3 -- What is the basis the BLM used for the conclusion that tar sand development is not economical and that expectations are for no improvement in outlook for 10 years? Was this conclusion based on industry predictions?

0972h

24.1 Volume 11 could resulst in an amendment to the Price River MFP. This volume shows the current leasing stipulations and policies in the Price River MFP. The impacts in this Regional and in the Sunnyside Tar Sand EISs are inconsistent but are not directly comparable for the reasons given in General Response 1 and Letter Response 14.18.

24.2 The difference in acreage figures for each EIS is a result of the lengths of project time for which the documents are prepared. The Regional EIS covers the impacts projected to take place within 20 years. The Sunnyside EIS covers the impacts projected to take place during the time span of each of the five proposed projects, as well as differing time spans for partial and unitized alternatives. Refer to General Response 1.

24.3 Refer to General Response 1.

24.4 Refer to General Response 1.

24.5 BLM recognizes the inconsistency, and these stipulations have been corrected throughout these documents.

24.6 The alternative suggested by the comment has been examined in Volume 11, Alternative 1. Under that alternative, all areas in the Sunnyside and Vicinity STSA except for the Sunnyside Water Supply Reserve and the Desolation and Grey canyons (category 2, 1,420 acres) would be leased in category 1.

Proposals for the complete exclusion of tar sand development or other surface-disturbing activities were applied to significant water sources where activity would create erosion and sedimentation hazards, as well as a potential for dewatering public water supplies. The intent of laws, such as PL-294 for the Sunnyside Water Supply Reserve, is to protect and provide a stable water supply to the Town of Sunnyside. This water reserve is entirely or mostly on greater than 50-percent slopes, making it highly susceptible to erosion if surface disturbance occurred (see Volume 11, Chapter 2, Sunnyside and Vicinity STSA (Southern Portion).

24.7 The potential disruption of underground aquifers was identified as a major issue during the public scoping process for this EIS.

It is possible that aquifer recharge rates could return to pre-mining levels following development activities. Further analysis would be required when plans of operations were submitted for review. Should impacts occur to water sources, legal stipulations would require that any loss of springs or perennial streamflow be fully mitigated with an equal quantity and quality of water (refer to Volume 11, Appendix 1, Public Water Reserve 107 and Legal Water Source Stipulations section).

24.8 The No Action Alternative (Volume 11) represents the existing leasing categories specified within land use plans. These categories were developed for oil and gas development. The Sunnyside Water Supply Reserve is placed in category 4 under Alternative 1 because of the steep slopes, erosion hazard, and present water uses (see Volume 11, page 68 of the Draft EIS).

Response Letter 24

24.9 The text has been revised in Volume 11 to delete the sentence referred to, along with the subsequent sentence. Also, the philosophy followed in EIS preparation is that selected leasing category stipulations and other mitigative measures generated as a result of the EIS analysis will be used as appropriate to prepare the basis for the terms of the lease. The actual selection of the stipulations and mitigation will be part of the decision process, which will not occur until 30 days after this Final EIS is filed with EPA. Selected stipulations and mitigation measures would apply to both lease conversion applications and new competitive leasing. Prospective lessees will have an opportunity to review and discuss lease terms prior to execution of lease documents.

24.10 BLM agrees that, under Federal law, golden eagle nests can be moved to mitigate impacts. However, there could be situations where movement of a nest may not be practical or biologically sound.

It is important to note that sensitive species, such as the golden eagle, will be considered on a case-by-case basis when an agreement has been made with the FWS as each plan of operations is reviewed for approval. (Please refer to Volume 1, Threatened, Endangered, and Sensitive Plant and Animal Species section, page 94 of the Draft EIS.)

24.11 The category 2 stipulations to protect sage grouse habitat apply to tar sand exploration and development as well as oil and gas recovery (see Volume 11, Introduction, page 1 of the Draft EIS).

24.12 The 25-percent figure is to be used as a general guideline. Special considerations such as lease boundaries and topography could result in a modification to this figure. Any modifications would require approval of the authorized officer of the BLM on a case-by-case basis.

24.13 This stipulation is to protect the Sunnyside Water Supply Reserve. The watershed is mostly located on steep slopes in excess of 50 percent and is highly susceptible to erosion. Any less than complete containment would make it difficult to ensure a stable, good quality water supply to the Town of Sunnyside which was the intent of PL-294. In the case of fugitive dust, successful revegetation can achieve 70-100 percent emission control from surface disturbance (Aerocomp, Inc., 1983a).

24.14 BLM agrees that it is unreasonable to expect that all contaminants can be contained. However, complete containment of contaminants or discharge is a State law.

24.15 The Regional EIS reflects exceptions to stipulations where considered appropriate. Stipulations prohibiting disturbances to wildlife habitat are corrected in Volume 11 of this Final EIS.

24.16 Under Alternative 4, 49,098 acres would be placed in category 2 with a stipulation allowing in-situ mining of the tar sand resource. Thus, tar sand development would not be completely excluded. This alternative would provide the most protection to other resources and did not consider the value of the tar sand resource.

24.17 This conclusion has been deleted from Volume II of this Final EIS.

Regulating in conjunction with the Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500, the Utah Water Pollution Control Board, Utah Water Pollution Committee, and Utah State Board of Health have set water quality standards to protect water ways for designated uses. These standards are listed in the Wastewater Disposal Regulations (State of Utah, Department of Social Services, 1978). The standards would be applied at the time of development of the tar sand resource.

In your example of fugitive dust, successful revegetation can achieve 70-100 percent emission control from surface disturbance (Aerocomp, Inc., 1983a).

Western Research Institute
P.O. Box 3395, University Station
Laramie, Wyoming 82071
307 721-2011

January 16, 1984

State Director
Bureau of Land Management
Utah State Office
University Club Bldg.
136 E., S. Temple
Salt Lake City, UT 84111

Dear Sir:

This letter includes remarks from two Western Research Institute (WRI) researchers on the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement prepared by the BLM. The reviewers were Miss Donna Sinks, geologist and Mr. Tom Owen, environmental scientist. These researchers performed key roles in the U.S. Department of Energy's (DOE) Tar Sand research program for several years, until our laboratory was defederalized in April 1983, and continue their tar sand responsibilities in WRI.

The review comments:

25.1 Basically, this document in three volumes is poorly organized and hard to use. The format could be amended to remedy this.

The content of Volumes I and III are very repetitive.

The lack of coordination with DOE is unfortunate (although DOE researchers at Laramie freely volunteered and did provide assistance to several DOI people working on the EIS).

25.2 The logic of offering combined leases in the Pariette SISA is questionable. The tar sand resource is small and of low quality. Conventional oil and gas leasing would be more logical since the potential for conventional oil and gas is good, according to the document.

25.3 The approach for special lease stipulations in Volume I, Appendix 2 is interesting. The approach is to make these special stipulations as restrictive as possible and allow for easing these restrictions if it is "in the public interest." A reverse approach where the stipulations could be made more restrictive if "in the public interest" would make more sense. (See page 213)

25.4 The assumed presence of a bitumen upgrading facility at each extraction or production facility is questionable. It is not practical that five 10,000 BPD facilities in the same SISA would each have its own little upgrading facility. This impacts on the projected air quality impacts for these areas.

An Affiliate of University of Wyoming Research Corporation

Comment Letter 25

State Director, BLM
January 16, 1984
Page 2

25.5 Page 15, left column, 3rd paragraph - the discussion of the origin of tar sand is only one possibility and is much too general.

25.6 Page 15, left, 4th para. - tar sand deposits are not necessarily "not homogeneous".

25.7 Page 15, right, 3rd para. - the White Rocks deposit is in the Navajo SS. The Asphalt Ridge and Northwest Asphalt Ridge deposits are both in the Nesaverde Formation of Cretaceous Age (principally) and the Duchesne River and Uinta Formations of Eocene or Oligocene Age.

25.8 Page 18, left, 1st and 2nd para. and pp. 46, 49, 50, 51 - "sandstone" and "formation" should be capitalized when preceded by proper nouns. It would be helpful to include the DOE definition of tar sand.

If you have any questions regarding our review comments or if we can be of any further assistance regarding tar sand please call on me.

Sincerely,

L. C. Marchant
Research Coordinator

Enclosures

cc: Sinks
Owen
Marchant

Response Letter 25

25.1 Refer to Letter Response 9.1.

25.2 CHLs are offered on the Pariette tracts because they fall within the STSA designated by Congress. Within STSAs, BLM can no longer issue oil and gas leases. However, because these tracts are located in important oil and gas producing areas, BLM is considering issuing CHLs to make oil and gas available. Also, BLM has placed restrictions on the development of tar sand in this area (refer to Volume III, Chapter 2, Description of Alternatives section). Because available data did not demonstrate any developable tar sand, no development of tar sand will be permitted on these tracts until a detailed in-depth environmental review is completed outlining potential impacts to existing and potential oil and gas development.

25.3 The special lease stipulations referred to are in addition to and are more restrictive than the lease terms and standard stipulations. The approach here is to start with fairly generic stipulations and make them more restrictive, as necessary.

25.4 For analysis purposes, this EIS generally considered that individual upgrading facilities located at each extraction operation would conform to the maximum extent possible with the plans of operations received in the conversion process. (It should be noted that this is a worst-case analysis.) The EIS assumption demonstrates lower maximum concentrations of air pollutants, but spreads the impacts over a greater area. Conversely, one operating facility serving several operations would cause higher maximum emission concentrations over a smaller area.

25.5 The description of the tar sand resource has been expanded in Volume I, Chapter 3, Description of Tar Sand Resources section in this Final EIS.

25.6 On a regional basis, the tar sand deposits are not believed to be homogeneous because of differences in thickness and saturation. While some of the deposits do show a fair amount of homogeneity (deposits contained in the Koenkopi Formation), literature indicates that most of the deposits do not appear to be homogeneous over several miles (Tripp, 1984).

25.7 This correction has been made in Volume 1, Chapter 2 of this Final EIS.

25.8 Corrections were made to reflect the comment concerning capitalization. The term tar sand, as it applies to this document, is defined adequately in the Glossary and essentially reflects DOE's definition.

United States Department of Agriculture
Soil Conservation Service
P. O. Box 11350
Salt Lake City, UT 84147

January 18, 1984

Roland G. Robison, State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East Temple
Salt Lake City, UT 84111

Dear Roland:

I appreciate the opportunity to review and comment on the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement.

There are several areas we think need to be addressed or clarified. Our concerns are as follows:

26.1 1. The impact on agriculture of changing water allocations and subsequent change in land use need to be addressed. In the water resource section of each alternative, a depletion is quantified but no indication is given as to the impact on irrigated agriculture.

The SCS and the Bureau of Reclamation are charged with improving irrigation system in the Uinta Basin and Price - San Rafael area. The water right will come from a previously allocated source. The majority of water rights in these areas are used for agriculture. In addition, the influx of people will acquire a reallocation of water to municipal use.

26.2 2. The possible impact to prime farmland needs to be addressed. The boundaries of several areas (e.g. Asphalt Ridge, White Rocks, Argyle Canyon, Willow Creek and Pleasant Valley) include irrigated farmland.

26.3 3. Alternative methods to control the projected soil loss and sedimentation problems need to be addressed. The problem of increased sediment is mentioned; however, no methods of control are suggested.

The Soil Conservation Service is an agency of the Department of Agriculture

Comment Letter 26

26.4 4. Under the heading of Water Resources, Vol. III, Chapter 3, page 25, the statement is made, "There are no floodplains or wetlands within any of the potential lease tracts". The statement needs to be clarified because references are made in both Vol, I and III to tracts containing riparian areas, wet meadows and some perennial streams.

Please contact me, if you have any questions.

FRANCIS T. HOLT
State Conservationist

cc:
Peter Myers, Chief

Response Letter 26

26.1 An addition has been made in Volume I, Chapter 4, Alternative 1 (Regional Overview), Water Resources section to show that a change of use would occur with conveyances of water rights. A change in water rights in many cases, would impact agriculture because this water would be diverted to tar sand related uses. Impacts on irrigated agricultural land cannot be quantified until the source and amount of water required for tar sand development and increased municipal demand in a given area is determined. However, any water diverted to tar sand related uses could result in the loss of production on farmlands. See Volume I, Summary, Unresolved Issues section.

26.2 A possible impact to prime farmland could occur if water rights were conveyed for use in a tar sand industry, as discussed in Letter Response 26.1. Where appropriate, impacts would have to be analyzed on a site-specific basis by an EA or EIS generated from a submitted plan of operations and tiered to this Regional EIS. It should also be noted that the population increase discussed in Volume I, Chapter 4, Socioeconomics section could create the demand for new housing areas, which could be built on prime farmlands.

26.3 Soil erosion and sedimentation problems could be minimized by implementing stipulations as discussed in Volume 1, Appendix 2, Special Stipulations section. Individual methods for controlling soil erosion are not discussed in this Regional EIS, but would be determined in detail on a site-specific basis.

26.4 The statement in Volume III, Chapter 3, Water Resources section, has been amended to read as follows: "There are small riparian areas (i.e., wetlands) within the potential lease tracts, however, there are no floodplains."

Comment Letter 27

UNITED STATES GOVERNMENT

memorandum

DATE: January 16, 1984

REPLY TO ATTN OF: Superintendent, Uintah and Ouray Agency
Attn: Land Operations

SUBJECT: Review and Comments on the Utah Combined Hydrocarbon Regional Draft EIS

TO: State Director, Bureau of Land Management

Comments from this office concerning the above referenced EIS will be general in scope with one exception.

27.1 We feel that Barneby Peppergrass (Lepidium Barnebyanum), a plant that was proposed as endangered in 44 FR 26535 dated 16 June 1976, should be included in the required T&E clearances as noted in Appendix 4 of Volume 1. At present there is only one known location for this species. Although it is outside of the proposed lease areas, the proximity of this plant to these leases warrents its inclusion on the referenced list.

27.2 After reviewing these drafts, we are dissatisfied with the consideration given the natural resource and the socio-economic well being of the Ute Indian people of the Uintah and Ouray Reservation. Seven of the proposed lease areas have potential major impact on the cultural and natural resource of the Ute people. The potential permanent loss of their cultural resource is unacceptable.

27.3 What impact will the increased human activity have on communities such as Ouray, Randlett, Fort Duchesne, etc.? This would include ingress and egress from such sites as Hill Creek, Parriette, Asphalt Ridge and Whiterocks ? The number of highways is listed, and the communities of Duchesne, Roosevelt, and Vernal are addressed for impact consideration, but very little mention is made concerning the such smaller communities.

We realize these general concerns will be more thoroughly addressed as site specific studies are completed. However, the concerns listed are real and pertinent to the Indian people of the Uintah and Ouray Reservation.

M Allen Cox

OPTIONAL FORM NO. 10
(REV. 1-80)
GSA FPMR (41 CFR) 101-11.6
5010-114

U.S. GOVERNMENT PRINTING OFFICE: 1981 0 - 361-216 (6733)

Response Letter 27

27.1 Barneby Peppergrass has been added to Volume I, Appendix 4 of this Final EIS and is included in the Argyle Canyon/Willow Creek and Sunnyside STSA candidate species lists.

27.2 Impacts to the Ute Tribe culture are identified in Volume I, Attitudes and Lifestyles section (page 123 of the Draft EIS) for the high production scenario and on page 163 for the low production scenario. Also, refer to Letter Response 15.1.

27.3 The EIS has identified transportation-related impacts to Ouray since a high commercial production scenario could result in 50 heavy trucks and 500 commuter round trips daily by 1995. Randlett and Fort Duchesne, located off the highway system, could expect to be only minimally affected under the analysis assumptions contained in this EIS. Also, refer to Letter Response 15.1.

Comment Letter 28

United States Department of the Interior

BUREAU OF RECLAMATION
UPPER COLORADO REGIONAL OFFICE
P.O. BOX 11568
SALT LAKE CITY, UTAH 84147

IN REPLY REFER TO: UC-150

120.1

JUL 20 1984

Memorandum

To: State Director, Bureau of Land Management, Utah State Office, University Club Building, 136 East South Temple, Salt Lake City, Utah 84111

From: Regional Director
Bureau of Reclamation

Subject: Review of Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement (DES 83-73)

We have reviewed the above draft environmental impact statement and have the following comments to offer:

General

28.1 The use of the Colorado River Simulation System (CRSS) model was appropriate in estimating projected salinity increases because of fresh water depletion; however, recognizing one of the major unresolved issues (water supply - page 8), no other water supply sources were acknowledged, explored, or examined. Previous studies by Reclamation (copies attached) have addressed the possible use of saline water collected in the Price-San Rafael drainages to support tar sand development.

Our appraisal studies indicate that if, for example, saline water from Desert Seep Wash were used for development of the Sunnyside tar sands area, a salinity reduction of 8.6 mg/L TDS could be realized at Imperial Dam. This alternative water supply contrasts with the projected use of fresh water with a maximum expected increase of salinity of 2 mg/L. Unfortunately, the Bitumen recovery process description is not provided with sufficient detail to indicate whether water would be used anywhere in the process.

Moreover, from the economic analysis performed on the use of drainwater, a cost-effectiveness of $511,000 per mg/L reduction and the Cost of Water (delivered) of $276 per acre-feet appears promising.

It is important to recognize the water supply option of saline drainwater and, particularly, to evaluate the potential benefits due not only to salinity control but also to the conservation of fresh water and related environmental benefits. Reclamation is prepared to work with the Bureau of Land Management and cooperating industrial participants in exploring saline water use opportunities throughout the Utah special tar sands area.

Comment Letter 28

The principal hydrologic issues have not been adequately addressed in this impact assessment for those aspects of the hydrologic environment that are most likely to be affected by the various anticipated levels of hydrocarbon development in Utah. The affected geographic region is likely to inhert certain changes to the existing hydrologic environment. From initial analysis of the potential development and the hydrologic conditions of this region, it is apparent that some aspects of the hydrologic environment would be more likely than others to be affected, and that some could be affected much more seriously than others. The purpose of an EIS is not only to identify potential changes but also to assess the magnitude of the changes, and to present significant impacts (in either beneficial or adverse ways) to the resource of the use or by the project's implementation.

The principal hydrologic issues that have been overlooked and should be addressed are:

1. Impact of Proposed Uses on Other Surface Water Users. This issue includes:

28.2 a. Water alternatives and their availability in the region and the Upper Colorado River Basin for uses in Utah for hydrocarbon developments;

28.3 b. provisions of interstate compacts and treaties that pertain to proposed surface-water uses;

28.4 c. effects of diversion and depletion of water on downstream users;

28.5 d. discussion of Colorado River System adjudication suit and other conflicts or controversies (i.e. Indian water right claims) that may affect water rights proposed for hydrocarbon development uses; and

28.6 e. effects of pumping ground water or destroying shallow aquifers through surface mining on streamflow or spring flow.

2. Impact of Proposed Uses on Other Ground water Users. This issue includes:

28.7 a. The effects of pumping ground water for surface mining or in situ processes would have on aquifers within the affected geographic region. Regional conditions, such as the location and extent of major and minor aquifers, need to be identified; and,

28.8 b. effects of various levels of development occurring at the same time on ground water users in the same approximate geographic region.

28.9 3. Alternative Sources of Water Supply. Most of the proposed tar sands development projects will consumptively use large amounts of water. The sources and allocation of water rights for a water demand of this significance need to be examined.

28.10 4. Impacts Due to Subsidence Potential. Ground water withdrawal for either surface mining operations or in situ extraction of hydrocarbons may cause a potential for land subsidence.

Comment Letter 28

Specific

28.11 1. Volume I, Regional Analysis, Chapter 2, pages 30-31. In Table 2-4, Water Resources, Water Depletions Unavoidable Adverse Impacts for Alternative 3 No Action category, 1,274,000 acre-foot/year is listed with footnote g. This number should be 1,283,000 acre-foot/year for year 2010, as shown in Appendix 3--Bureau of Reclamation Projected Water Supply and Depletion, August 1982.

28.12 2. Volume II, Summary, page 1. Five major issues related to the tar sand development within all STSA's are listed. A major issue that is not listed is the issue of water rights because, as stated in Volume I, water rights in the STSA's are fully appropriated by existing rights or applications for rights; therefore, (1) an adequate water supply must be present and (2) the rights to consumptively use that water must be obtained before any tar sand development can occur. We recommend that the complexities and uncertainties of attaining water rights in these water-short areas be an issue that is not overlooked.

28.13 3. Volume III, Chapter 4, page 77. Summary of Unavoidable Adverse Impacts, Irreversible/Irretrievable Commitments of Resources and the Relationship of Short-Term Use of the Environment to Maintenance and Enhancement of Long-Term Productivity refers to Table 2-5. This table does not exist in Volume III or Volume I. In Volume II, Table 2-5 tabulates "Lands Under Wilderness Review for the Sunnyside and Vicinity STSA. We believe Table 2-5 should be Table 2-4 in Volume I.

28.14 4. Page 105, "Water Requirements and Effects on Colorado River System." Please note that the current (1982) damages for salinity are about $113 million (not $320 million) and are projected to reach $267 million in annual damages by 2010 under future conditions.

We appreciate the opportunity to review this draft environmental impact statement.

Attachments

CONSULTATION AND COORDINATION

Response Letter 28

28.1 Surface and groundwater resources within or near the STSAs were analyzed as possible supply sources (see Volume I, Tables 3-5 and 3-6, pages 39-42 of the Draft EIS). Obtaining the necessary water rights at a feasible cost would remain a consideration in the growth of a tar sand industry. Saline water sources, as referred to in the comment, may be viable in some STSAs. These water supplies (i.e., poor quality water) are not precluded by this EIS and may be proposed as sources in site-specific analyses. For additional information, refer to the report entitled Potential Hydrologic Impacts of a Tar Sand Industry in 11 Special Tar Sand Areas in Eastern Utah (USDI, GS, 1983).

The availability of and impacts to water on a regional basis were examined in detail in Volume I, Chapters 3 and 4 and Appendix 3.

28.2 Because Volume I is a regional analysis, water quantity impacts to individual streams, with some exceptions, were not analyzed as long as it appeared that water existed in the amounts estimated as needed. As plans of operations from interested companies are examined for water requirements, alternatives can be analyzed, where appropriate, by an EA or EIS to determine water quantity, quality, and source impacts. This would be done on a site-specific basis and would be tiered to this Regional EIS. Consequently, this Regional EIS analyzes the availability of water from an overall standpoint of present and projected water uses.

28.3 These provisions were accounted for in Volume I, Appendix 3. Water requirements for a tar sand industry in Utah, as discussed in this EIS, would be provided from Utah's portion of the Colorado River Basin water allocation.

28.4 Effects on downstream users on a site-specific basis would need to be analyzed, as discussed in Letter Response 28.2.

28.5 The water rights question is significant, and it is addressed somewhat in Volume I and Volume II, Chapter 4. It is, however, a legal question. Negotiating for water rights would be the lessee's responsibility and would need to be assessed on a site-specific basis.

28.6 Important aquifers would receive legal protection as described in Volume II, Appendix 1, Public Water Reserve 107 and Legal Water Source Stipulations section.

28.7 Considerable hydrologic information is available for the 11 STSAs and has been briefly summarized for surface and groundwater in Volume I, Tables 3-5 and 3-6, pages 39-42 of the Draft EIS. Again, site-specific analysis may be necessary, as discussed in Letter Response 28.2. Additional data on aquifers may be required, particularly where little data are presently available.

28.8 Refer to Letter Response 28.2.

Response Letter 28

28.9 Refer to Letter Responses 28.1 and 28.2.

28.10 Subsidence resulting from sustained groundwater withdrawal has been documented in areas of unconsolidated alluvial material. The STSAs addressed in this EIS are all located in consolidated formations. It is believed, therefore, that the potential for subsidence resulting from groundwater withdrawal is low.

28.11 Table 2-4 has been corrected in Volume I in this Final EIS.

28.12 Refer to Letter Response 28.5.

28.13 The reference should be to Volume III, Table 2-2, rather than to Volume I, Table 2-4. The text has been corrected in this Final EIS to reference Table 2-2.

28.14 The text in Volume I of this Final EIS has been changed to conform to the comment. Numbers used were generated by taking the 1980 TDS level of 781 mg/l X $264,510 (1980 dollars) X 1.55 (factor to adjust to 1983 dollars) to arrive at $320,202,580 which was rounded to $320,000,000.

Comment Letter 29

FRIENDS OF THE EARTH

1045 SANSOME STREET SAN FRANCISCO CALIFORNIA 94111

(415) 433-7373

January 18, 1981

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Sir:

Friends of the Earth, a national conservation organization dedicated to the preservation, restoration and rational use of the Earth, respectfully submits the following comments on the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement prepared by the Bureau of Land Management.

These comments will be divided into three sections, Introductory Comments, General EIS Comments, and a Conclusion and Recommendation.

Introductory Comments

29.1 Although the expressed purpose of this EIS is to provide "an analysis of regional impacts resulting from implementation of several different development levels," under the auspices of the Combined Hydrocarbon Leasing Act of 1981, it is highly questionable whether the intent of Congress is being served by this document.

In our view, it is not the purpose of P.L. 97-78 to encourage the degree or the nature of the various proposals associated with Tar Sands development as outlined in the EIS.

Therefore, the Bureau of Land Management has taken on a discretionary authority far beyond that allowed by the Act in proposing to allow what amounts to a massive hydrocarbon leasing program on public lands.

We would submit that it is also entirely premature to conduct such leasing sales program based on the extremely cursory outline of the various aspects of Tar Sands development and its resulting impacts contained within this document.

29.2 At the present time, the industrial technology required for extracting bitumen components from Tar Sands deposits is in a very early stage of development.

Those energy companies expressing an interest in leasing these hydrocarbon resources can not be prepared to initiate an extraction program on the massive scale outlined in this document when such technology has yet to even be successfully applied on a "pilot" or demonstration level, as is currently the case with the technology regarding the extraction of Oil Shale deposits.

In additionto a lack of currently available and demonstrateable technology for extracting these tar sands deposits, there remains a distinct lack of any economic incentive for such development.

Committed to the preservation, restoration, and rational use of the biosphere

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Comment Letter 29

29.2 Yet, the EIS presents a set ofentirely hypothetical levels of development, all of which contain completely unacceptable levels of environmental impacts, and none of which are feasible from either a standpoint of free market economics, and/or proven technology.

Therefore, it can be assumed that the only reason for energy companies to acquire federal leases for tar sands deposits at this time is of a purely speculative nature.

We would seriously question the validity of a leasing program that serves only to transfer future resource management options regarding federal lands unbeknownst by tar sands deposits from the public domain to private industry.

General Comments

29.3 The basic ecological information such as the nature, composition, location, extent, depth and amount of bitumen present within the individual tar sands deposits contained within the eleven STSA'S is so vaguely known at this time as to be reason enough to disqualify this EIS as a decision document for any future leasing program. Until such time when the resource can be further quantified to an appreciable degree, it is virtually impossible to analyze the technology required for its extraction and the resulting environmental impacts from such development.

29.4 The statement, "little on-site air quality data have been collected," (Vol.IV.) underscores the fact that not enough is presently known about either the existing air quality of the STSA'S or the resulting impacts from the hypothetical alternatives of tar-sand development. To delay an adequate analysis of the air quality impacts from the proposed development of the tar sands deposits until the UIP permit stage is reached cannot allow for responsible resource management planning on a regional basis, which is the ostensible purpose of this EIS.

The preliminary indications contained in the EIS indicate, in any case, that the cumulative air quality impacts would be completely unacceptable at either alternative level of development.

One of the most critical concerns regarding the potential development of tar-sand deposits, water supply, is left as an "Unresolved Issue."

29.5 Considering that "most water in the tar sand areas is fully appropriated," (Vol.IV.105), and, "the amount of water needed to process tar sand is currently only estimated," (Vol.I.p.9). it is reasonable to assume that until such a major issue as the availability of and need for water, can be quantified and adequately analyzed to determine whether or not sufficient quantities exist for the development of the tar sand deposits while still allowing for other considerations, including endangered species and recreation, no rational decisions regarding leasing such tar sand deposits can be made.

29.6 The critical question of the restoration of the proposed strip-mined area is also left as an "unresolved issue." Since the possibility of restoring strip-mines in the affected areas can not be assured or even reasonably anticipated, the EIS cannot sufficiently evaluate the associated impacts of soil erosion, degradation of water quality, or the disruption of natural ecosystems. The document states that "The extent of rehabilitation cannot be predicted because planning and mitigation could not be completely defined during preparation of this EIS." (Vol.I.p9).

2

CONSULTATION AND COORDINATION

Comment Letter 29

29.8 cont. It seems highly unlikely that such a complex issue can be "completely defined" as promised in futures EA's or EIS's.

Therefore, for the reasons outlined here above, this EIS cannot be considered to be a legally adequate document that can be used for decision making that may result in either the issuance of lease tracts or any amendments to leasing categories within BLM lands use plans under the provisions of the National Environmental Policy Act of 1969 or in accordance with the Council of Environmental Quality regulations implementing the National Environmental Policy Act.

Conclusion and Recommendation

Since there remains a distinct lack of any documented need to lease public lands for the extraction of tar sands deposits within the eleven STSA's, the Bureau of Land Management should discontinue its program to allow for the leasing of these fossil fuel resources.

Friends of the Earth supports an alternative not offered in the document, and distinct from the "No Action" Alternative. We would request that the eleven STSA's be set aside at this time to be managed as a public trust by the Bureau of the Land Management for the exclusive use of future generations.

Such a policy could preserve these tar sands resources until such time when they are actually needed, when the technology is available to allow for their careful, well-budgeted extraction under a thoroughly researched mining and reclamation plan which would assure complete protection of the environment.

Sincerely yours,

Gordon Anderson

Gordon Anderson
Colorado Plateau Representative
Friends of the Earth
170 South 300 East #5,
Provo, Utah 84532

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Response Letter 29

29.1 Refer to Letter Response 18.8. The purpose of the Regional EIS is to analyze impacts from a high commercial production level, a low commercial production level, and no commercial tar sand production (Alternatives 1, 2, and 3, respectively). Production levels were estimated for each STSA as discussed in Volume 1, Appendix 1. Also, refer to Letter Response 18.7.

29.2 The purpose of this EIS is not to determine a production level of a tar sand deposit from the standpoint of "free market economics," rather, this EIS analyzes the potential cumulative impacts associated with different production levels of the tar sand resource. Industry will determine ultimate production levels based on prevailing economics, subject to the leasing scenario and stipulations as set by BLM in the Record of Decision for Volumes II and III following publication of this Final EIS.

The reason for which any company may wish to acquire a lease for the tar sand resource is assumed to be for the development of the resource. All CHLs would have to be in production within 10 years in order to maintain their lease.

29.3 It is true that, at the present time, the geologic environment of the tar sand resource has not been studied in enough detail to fully assess the technology required for development. This technology may differ from one STSA to another. Until further tests of each resource are made, firm determinations of the technology required cannot be made.

The purpose of this EIS is to amend the existing planning documents, analyze leasing scenarios, and analyze general and special protective stipulations for the STSAs. Once these stipulations are determined, production could take place as long as the stipulated resource protection was provided for. This would allow for progress in technology.

29.4 The present air quality assessment is to satisfy NEPA and current CEQ requirements, rather than to support PSD permit applications. Sufficient data are now available on dispersion climatology, terrain, ambient air quality, and projected emissions to formulate a regional overview and cumulative impact analysis for planning purposes. Also, refer to Letter Response 2.19 and the regional air quality technical report completed by Aerocomp, Inc. (1983a).

For information regarding water supplies, refer to Letter Responses 26.1 and 28.2.

29.5 The appropriation, availability, and adjudication of water rights and the way these issues affect or are affected by various laws, regulations, and plans are site-specific issues. The variables involved at the regional level are so numerous that an attempt to address all of the possibilities and ramifications of each is impractical.

This EIS contains a description of water resources and expected impacts, based on available data. Refer to the disclaimer in Volume 1, Appendix 3. Also, refer to Volume 1, Chapter 4, Alternative 1 (Regional Overview), Water Rights, Water Resources section.

Response Letter 29

29.6 The limitations of the analyses contained in this Regional EIS are clearly stated. Further site-specific, in-depth analysis based on a plan of operations will be conducted, where appropriate, prior to commencement of operations. 43 CFR 3570 states that the plan of operations "will ensure reasonable protection of the environment." As stated in Volume I, Summary, Purpose and Need section: "This EIS is needed to comply with NEPA regulations related to Federal actions. The EIS evaluates the impacts of implementing the entire CHL program." The impacts of strip mining are currently characterized and documented in this Regional EIS. Also, refer to Letter Response 18.55.

Comment Letter 30

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
1311 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138-1197

(ES) January 19, 1984

MEMORANDUM

TO: State Director
Bureau of Land Management
Utah State Office
Salt Lake City, Utah

FROM: ACTING Field Supervisor
Ecological Services
Salt Lake City, Utah

SUBJECT: Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement (DEIS)

We have reviewed the Utah Combined Hydrocarbon Regional DEIS. We are concerned about several areas of the various operations and lease conversion programs described in the DEIS that may not provide for adequate protection and/or mitigation of wildlife resources. Our comments follow:

Volume I

Chapter 3 - Affected Environment

30.1 Pages 53 and 56. Riparian Vegetation. The document points out the importance of riparian habitat to wildlife, but then goes on to say only 100 acres will be disturbed. This is inconsistent with the Sunnyside Combined Hydrocarbon Environmental Impact Statement (EIS) where it estimates 645 acres of riparian habitat will be disturbed on that STSA alone. We strongly recommend this major discrepancy be corrected so decision makers can fairly evaluate the resource costs of the program.

30.2 Page 56. Raptor Habitat. Prairie falcons and golden eagles should be included in the list of common raptors found in the STSAs.

Comment Letter 30

Chapter 4. Environmental Consequences

30.3 Page 94. Assumption 16. Assuring that, for most projects, all impacts would occur within the STSA boundaries severely underestimates the potential impacts of tar sands development. Furthermore, the assumption is inconsistent with the documentation of secondary impacts to animal life (page 110), recreational resource use (page 113), air quality (page 102), and socio-economics (page 116) in the region. Offsite and indirect impacts from proposed population increases associated with the projects could pose greater threats to the natural resources than the impacts from the projects themselves. This assumption (number 16) should be eliminated.

30.4 Pages 99 and 100. Air Quality Table 4-3. The projected pollutant increases under the colum entitled "Project Sources - Secondary" are inconsistent with other energy development reports and need further clarification. In the Uintah Basin Synfuels Development EIS (page K-4-37), it states that "secondary area emission sources dominate the total impact." The secondary emission sources shown in the Combined Hydrocarbon EIS are near 0. We suggest these results be rechecked and the models used to obtain these figures be scrutinized. The affected outcome on air quality impacts may be greatly different than what is shown.

30.5 Page 103. Water Quantity and Quality. The EIS only directs its discussion of water quantity depletions to major drainages in eastern Utah. The document does not adequately address the impacts to springs and seeps that provide important surface water and woody vegetation food and cover for wildlife. After stating the importance of riparian habitat for wildlife (page 53), no correlation is made between riparian habitat and water depletions. Seeps and springs in the STSAs should be clearly identified in the "Affected Environment" section of the EIS. The possible impacts and mitigation and/or protection for the important water sources should be documented in the appropriate environmental consequences and mitigation-protection chapters of the EIS.

30.6 Page 110. Animal Life. As stated in the EIS. "Because there are insufficient data to quantify secondary impacts," the document has failed to discuss the indirect impacts from increased human activity. The Fish and Wildlife Service (FWS) believes the offsite, indirect impacts from the combined hydrocarbon program could be as great or greater than the direct impacts to wildlife resources. Several impact assumptions could be made, if only qualitatively, based on projected population increases. The FWS has published a report entitled 'Human Demographic Impact Study" that attempts to quantify impacts expected from energy development related population increases. We recommend data from reports like this be included in the "Environmental Consequences" chapter of the final EIS. Decision makers should be aware that these secondary and indirect impacts would occur before leasing and conversion decisions are made.

Comment Letter 30

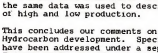
30.7 Page 111. Antelope. The document states, "Because of the large amount of substantial value range and few numbers of animals, no impacts to pronghorn antelope are expected to occur." This statement is questionable if not totally inaccurate. Critical winter and summer range migration routes or fawning and breeding areas have not been identified. Development on or near these critical habitats would adversely effect antelope.

30.8 Page 111. Animal Life. Under subsections entitled "Small Game," "Upland Game," "Unique and Limited High-Value Wildlife Habitats," and "Threatened and Endangered Species," a common theme is noted. "Because of lack of census data," losses cannot be quantified. Since no information is provided for non-game species, the same "lack of census data" assumption is made by this reviewer. Provisions should be clearly identified in the EIS for collecting necessary information about important and valuable habitats so mitigation can be provided for impacts from proposed conversions and leases.

30.9 Page 11b. Population. A population increase of 53,091 for direct and indirect developments is projected in 1995. This does not, however, include the direct and indirect increases from the proposed Bohio project. According to the table on page 22, that project would have a construction force alone of 19,900 workers. Excluding the Bohio project from a regional population scenario because it is on private land is inappropriate. It seems safe to assume that Federal permits will be required for the facility. But, regardless of whether Federal involvement will occur on Bohio or not, when discussing the regional effects of hydrocarbon development, all projects should be included. Regional impacts do not stop at bureaucratic jurisdictional boundaries.

The previous comments apply to the appropriate sections of the "Low Commercial Production" discussion in Chapter 4 as well since the same data was used to describe the environmental consequences of high and low production.

This concludes our comments on the Regional DEIS for Combined Hydrocarbon development. Specific comments on endangered species have been addressed under a separate memorandum from the Endangered Species Team Leader. If you have any questions concerning these comments, please contact Jim Munson, Ecological Services, Division of FWS in Salt Lake City, Utah.



30.1 The 100 acres of riparian habitat referenced in Volume I, Chapter 3, Vegetation section, have been changed to 925 acres in this Final EIS. Also, refer to General Response 1.

30.2 Prairie falcons are included in the list of raptors found in the STSAs in Volume I, Chapter 3 of the Final EIS. Golden eagles are considered sensitive species and are discussed under the Threatened, Endangered, and Sensitive Animal Species section in the text.

30.3 The assumption was incorrect. Refer to Volume I, Chapter 4, Analysis Assumptions and Guidelines, revised Assumption No. 16 in this Final EIS.

30.4 Most of the secondary emissions in the Uinta Basin synfuels development are expected to be particulate concentrations from unpaved roads (Systems Applications, Inc., 1982). Conversely, in the Regional EIS, particulate emissions from unpaved haul and access roads are considered major contributors to primary emissions (Aerocomp, Inc., 1983a). Secondary emission sources in the Regional EIS include population-induced emissions compiled from the Utah Bureau of Air Quality (1982) Baseline Emissions Inventory. The baseline projection assumptions have identified significant secondary emission sources near or at urban areas. However, primary emission sources would have the highest values at the tar sand development sites.

30.5 The loss of riparian habitat was discussed in relation to the loss of wildlife, fisheries, and other resources dependent on this habitat. See Volume I, Chapter 4, Alternative 1 (Regional Overview), Vegetation section, Unique and Limited High-Value Habitat section and Aquatic Species section. Hydrologic data on areas such as seeps and springs would be protected as explained in Volume 1, Appendix 2. Also, refer to Letter Response 28.6.

30.6 BLM has obtained a copy of the document referenced in the comment. Based upon that report, we have included the following information regarding indirect impacts in Volume I, Chapter 4, Animal Life sections of this Final EIS: "Tar sand development could impact wildlife populations directly (i.e., loss of habitat) and indirectly (i.e., human activity such as increased hunting pressure, harassment, wanton killing, poaching, and off-road vehicle use). It is important to note however that, depending upon the extent of development, indirect impacts to wildlife populations or habitats could equal or exceed direct impacts in some cases (Thomas, 1983)."

30.7 According to the UDWR, there are no crucial fawning and breeding grounds or migration corridors for antelope in this area. Because there are no significant resources involved, no impacts to antelope are expected to occur.

30.8 Impacts to nongame species were not identified as a significant issue during the scoping process. Therefore, impacts to these species are not addressed in detail. Refer to Letter Response 14.21 for a definition of "significant issues." Volume I, Chapter 4, Air Quality and Water Resources sections discusses inventory and mitigation activities. Additional inventory or monitoring activities should be developed when actual plans of operations are submitted and reviewed.

30.9 The Sohio project has not been excluded from the analysis because it is located on private land. Sohio has been included as an interrelated project but is not part of the projected baseline. Analytical summaries of interrelated projects have been added to Volume 1, Appendix 10 in this Final EIS. For greater details concerning cumulative impacts, please refer to the regional socioeconomic technical report prepared by Argonne National Laboratories (1983).

It should be noted that the projected baseline of each tar sand alternative is composed of normal growth rates and projects that are reasonably expected to occur. Some interrelated projects, such as Sohio, were not included in the projected baseline because they are considered speculative at this time.

United States Department of the Interior
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:

L7617 (RMR-PC)

JAN 18 1984

Memorandum

To: State Director, Bureau of Land Management, Salt Lake City, Utah

From: Regional Director, National Park Service, Rocky Mountain Region

Subject: Review of Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement (DES-83/73)

The National Park Service (NPS) has reviewed the subject draft environmental impact statement (EIS) and has the following comments.

The Bureau of Land Management (BLM) is to be commended for its effort to evaluate a number of highly complex issues associated with tar sand development. Our comments pertain to the manner in which Utah tar sand development could affect the parks in our Rocky Mountain Region.

Volume I: Regional Analysis

General Comments:

The document predicts significant or major adverse impacts to Glen Canyon National Recreation Area, Capitol Reef and Canyonlands National Parks, Dinosaur and possibly Colorado National Monuments under the high production alternative. The low production alternative would still have significant effects on at least Glen Canyon National Recreation Area and Canyonlands National Park. We also note that the production levels evaluated for each of the nine tar sand areas (STSA's) discussed are estimates made for analytical purposes, and would be subject to adjustment by individual BLM leasing decisions. It thus appears quite feasible to achieve a mix of production levels among the STSA's that would not significantly affect parks - especially under the low production scenario. The NPS could not support a combination of leasing actions that would result in significant adverse

31.1 effects on park units. We therefore recommend that whatever production targets are set regionally, leasing be allocated among the eleven STSA's so as to have the least effect on parks and other conservation areas. This would suggest targeting low leasing levels in the Tar Sand Triangle, Circle Cliffs, and Asphalt Ridge. Any given regional production (goal) level between the ranges analyzed in this document could still be achieved through greater leasing in the other STSA's.

31.2 To present a complete understanding of the cumulative tar sand development impact, we suggest the document give greater clarity to the magnitude and location of tar sand operations already proposed for conversions to combined hydrocarbon leases (CHL's).

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Our specific comments below point out the need to have the EIS broaden the baseline for air quality impacts to include all known point and non point sources that already contribute to consumption of PSD increment in national park system units.

Our comments also emphasize the need to better quantify and identify the significance of cumulative impacts. We submit, for example, that an effective analysis of such impacts can only be made by solving the "unresolved issues" due to their magnitude and importance.

Specific Comments:

31.3 Page 2. The draft EIS assumes approximately a 20-year period for exploration and development of the tar sands. In the Tar Sand Triangle STSA, there is already a specific proposal for a much longer period. Where such information is available, it should be included. The EIS should recognize that Dinosaur and Colorado National Monuments, although Class II Federal areas, have been recommended by the Department of the Interior for Class I designation. These areas are also Colorado Category I areas which incorporate the Federal Class I PSD limit for SO_2. For a complete analysis we believe the PSD modeling should include an analysis for these parks done at the Class I level (beginning at the Colorado State boundary for Dinosaur).

31.4

31.5 Page 5 to page 113. The endangered Colorado squawfish and humpback chub occur in Dinosaur National monument. The document should be expanded to identify more specifically and quantitatively the potential impacts on these fishes from water depletions, heavy metals leaching, ion balance changes, etc. Population reductions of these fish occurring in downriver areas could potentially affect the viability of populations in Dinosaur National Monument. Appendix A should be referenced to give the reader a complete picture of the consultation requirements of the Endangered Species Act.

31.6 Pages 5 and 8. The document, under Alternatives 1 & 2, acknowledges that there would be additional impacts on recreation sites. The document should attempt to identify and quantify the potential recreation impact on units of the National Park System, other Federal recreation areas and state and local recreational facilities. Such quantification is also lacking in the later "cumulative" and "site-specific" analyses.

31.7 Page 8. "Unresolved Issues." Most of these issues have potential for affecting units of the National Park System. The final EIS and the Record of Decision should reflect efforts to resolve these issues. If the specifics cannot be predicted, certainly the goals and objectives of the reclamation plan can be presented. The goals may differ for lands which are administered under special legislation such as for units of the National Park System.

31.8 Pages 21 and 90. To completely analyze regional impacts the EIS should describe the upgrading facilities typically required following in-situ extraction, and it should discuss the availability of transport facilities for the produced oil. Especially useful would be a description of existing oil pipelines and refineries.

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31.9 Page 33. A small portion of the Tar Sand Triangle extends into Canyonlands National Park, a Class I air quality area. Additionally, see above comment for page 2.

31.10 Page 58. On this page, 26,720 acres of the Circle Cliffs STSA are indicated as being within Capitol Reef National Park. Later, on page 64, a figure of 30,720 acres is given. There is confusion over what was intended by the various designations of Federal land that are listed, i.e., Federal, BLM and NPS. In volume one (page 13), 50,760 acres are listed as "BLM administered lands," but on page 16 of that same volume 50,318 acres are listed as "Federal."

31.11 Page 61. The DEIS notes that nationally significant scenic and recreational resources exist in and around the Tar Sand Triangle. We agree. The impacts of tar sand development decisions in this area should be evaluated in that light.

Page 62, first paragraph. "Hands Flat" should read "Bans Flat."

31.12 Page 62, paragraph 9. The proposed wilderness lands in Glen Canyon National Recreation Area are not available for leasing, nor are existing leases there eligible for conversion to GRL's. These facts should be stated in this paragraph.

31.13 Page 64. The EIS notes that the visual resource values of the Asphalt Ridge and Raven Ridge STSA's are "limited." The EIS should also note, however, that both areas are components of the vistas from Dinosaur National Monument.

31.14 Page 93, item 5. A worst-case impact situation is apparently not always used in the DEIS. For example, on page 21 the DEIS states that in-situ development disturbs 50-60 percent of the developed surface. The impact analysis uses a uniform 40 percent disturbance factor.

31.15 Page 94, item 10. The EPS is concerned that the presentation in the draft EIS of the air quality modeling results could easily lead to misinterpretation of the results.

It must be emphasized (probably in the Analyses Assumptions in Guideline section of Chapter 4) that the VALLEY-BID model was chosen because of its economy of use, and because it was assumed that the maximum concentration would, for all Special Tar Sand Study Areas (STSAs), be due to complex terrain. However, while it is true that VALLEY-BID may give conservatively high concentration estimates for receptor locations on elevated terrain features that are higher than the effective height (physical stack height plus the rise of the plume), VALLEY-BID could actually underestimate maximum concentrations if such terrain features are not present near the proposed development. This is due to the use in VALLEY-BID of very stable atmospheric conditions which lead to very narrow, confined plumes. The site specific analyses, because they include the details of the local topography, may actually indicate higher pollutant concentrations than estimated in this DEIS. Such higher pollutant concentrations would be caused by the interaction of the plume with elevated terrain below effective plume height

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31.15 cont. with broader more dispersed plume due to unstable or neutral atmospheric conditions. This is especially true for Tar Sand Triangle STSA in Glen Canyon National Recreation Area and may also be true for Circle Cliffs STSA near Capitol Reef National Park. Therefore, the air quality analyses in the DEIS constitute a first approximation to pollutant concentrations and are not necessarily a conservative estimate.

Also, the technical support document does not contain sufficient detail for evaluating the level-2 visibility analyses. The discussion should at a minimum include observer location, observer-target line of sight and the orientation of the plume with respect to the line of sight.

31.16 Page 94, item 13. The transportation analysis should indicate the level of truck traffic necessary at each STSA to accommodate the high and low production scenarios.

31.17 Pages 95-101. On page 95 we believe the reference to Dinosaur National Monument under P.R. Spring visibility impacts is erroneous; it should be Colorado National Monument.

31.18 Page 102. The EIS should clearly compare the projected pollutant levels with the levels that are projected for current developments (e.g., White River Shale Oil, Moon Lake Power Plant, etc). It is our understanding that these two projects alone may utilize most of the allowable Class II PSD increment in northeastern Utah; they may also meet or exceed the Colorado Category I constraints on SO_2.

31.19 Additionally, the EIS notes that NO_2 concentration isopleths show elevated levels in the northern part of the Region. The EIS should note, however, in Table 4-1 that Asphalt Ridge and Raven Ridge taken in combination could pose potential exceedance of NAAQS for NO_2 and TSP in the Dinosaur National Monument. Taken singly, the analysis of these two STSA's does not present an adequate picture of the potential impact at Dinosaur National Monument.

31.20 Page 108, Table 4-6. It is useful to note here that while 2800 disturbed acres for in-situ operations at the Tar Sand Triangle is reasonable to assume through 2005, just one company has proposed in-situ development there through year 2080, or longer, which would disturb more than 14,000 acres over the life of the project. This illustrates the minimizing effect of limiting the discussion to early development years instead of analyzing the effects of eventual development on all of the land being considered for leasing.

31.21 Page 113, "Recreation." Portions of Glen Canyon National Recreation Area, a recreational resource of national significance, could be adversely affected by development of the Tar Sand Triangle. Recreational values at Capitol Reef and Canyonlands National Parks may also be impacted.

31.22 Paragraph 2. Reference earlier comments on concerns about endangered fishes relative to flow depletions and water quality degradation.

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31.23 Page 114, "Visual Resources." Should note that development of the Raven Ridge area could have an intrusive effect on views from overlooks within Dinosaur National Monument. Similar concerns should be expressed for the Circle Cliffs area as seen from Capitol Reef National Park.

31.24 Page 114, "Cultural Resources." Mention should be made here of the many sites in the Tar Sand Triangle which could be affected, and of the proposed Orange Cliffs Archeological District. No discussion of cultural resource impacts is included under the Alternative 2 analysis.

31.25 Page 115, Table 4-8. Horseshoe Canyon is part of Canyonlands National Park. The name Horseshoe Canyon National Park is incorrect.

31.26 Page 123, last paragraph. The NPS would object to commercial use of Burr Trail through Capitol Reef National Park for tar sand development. Such commercial use would degrade and detract from visitor use and enjoyment of the park. One applicant for conversion leases in the Circle Cliffs STSA has already proposed to use the western access road for carrying out his plan of operations.

31.27 Page 128, "Circle Cliffs STSA." Data are presented to show potential air quality, visibility, visual, and recreational impacts on Capitol Reef National Park. The document reports that Class 1 air quality standards may be violated and visibility impairment experienced at Capitol Reef only under the high production scenario. In Volume II, however, the assumptions differ. Where Volume I bases the high production scenario on in-situ development only over 7,300 acres, Volume II discusses in-situ development on 18,800 acres and surface mining on another 8,500. Surface mining impacts are not even considered in Volume I. This not only appears inconsistent, we are concerned that Volume I may drastically underestimate cumulative tar sand development impacts on Capitol Reef National Park.

31.28 Page 128. The potential effects on water resources in the Circle Cliffs are of substantial concern to the NPS. Most of the STSA drains into the Escalante River in Glen Canyon National Recreation Area. All of the river system in Glen Canyon National Recreation Area is proposed wilderness and considered one of the primary backcountry/wilderness resources of the national recreation area. As noted in Table 3-15 of the DEIS, this river has a variety of resource values of national and regional significance. Since the sediment yield over 20 years from 2,900 disturbed updraimage acres could be tremendous, we feel there are major potential impacts that are not fully discussed here.

31.29 Page 139, "Air Quality." The increment violations predicted here would preclude this alternative from being implemented. Subsequent leasing decisions in the Tar Sand Triangle should be made with that in mind.

31.30 Page 139, "Topography." The lands in Glen Canyon National Recreation Area mentioned as suitable for surface mining are mostly closed to any leasing. Surface mining would be prohibited even on any open areas leased for tar sands, as specified in Appendix 2, Volume III of this DEIS.

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31.31 Page 135, "Water Resources." Water would probably be withdrawn directly from the Dirty Devil under this alternative, as already proposed by lease applicants.

31.32 Page 153, Table 4-19. About 96 percent of the bighorn sheep impact predicted under this alternative would occur at Circle Cliffs and the Tar Sand Triangle on "crucial" or "substantial value" habitat near or within park units (Capitol Reef, Glen Canyon, Canyonlands). The same areas account for 90 percent of the regional bighorn impact under the high production alternative (Table 4-7). This suggests that a major impact affecting three parks could be nearly eliminated by curtailing CHL leasing near the habitat areas. The effect on regional production should be minor.

31.33 Page 155, Table 4-20. See comment above, page 115.

31.34 Page 175, "Recreation and Wilderness." We agree that there could be a significant loss of scenic and recreational values at Glen Canyon National Recreation Area and Canyonlands National Park through development in the Tar Sand Triangle, even under the low production alternative.

Map. We suggest that the large foldout map have an additional color code to better delineate units of the National Park System. This would distinguish NPS-managed lands from private lands. Further, the map excludes one section from Capitol Reef National Park (Sec. 36, T35S, R8E, a State section). The map also incorrectly identifies some 1,840 acres in T35S, R7E as being administered by BLM. These lands incorporate the Silver Falls Creek and Woody Creek drainages and should be shown as within Glen Canyon National Recreation Area.

Volume II. Leasing Category Amendments

General Comments:

Our comments below on the Circle Cliffs STSA amount to support for Alternative 4. The NPS strongly urges BLM to adopt Alternative 4 for the Circle Cliffs STSA.

31.35 The impact summaries for Asphalt Ridge, Circle Cliffs, and White Canyon appear confusing because there is very little practical difference between the alternatives. For example, all three options for White Canyon would allow development of 97 percent of the STSA. It is difficult to focus on the land-use issues with such small differences between alternatives. Perhaps the EIS should also consider scenarios involving a lesser level of development.

Specific Comments:

31.36 Pages 4 and 127. We suggest that the EIS incorporate air quality, especially visibility, as major issues for Asphalt Ridge due to the proximity of Dinosaur National Monument.

CONSULTATION AND COORDINATION

31.37 Page 10, paragraph 5. Since converting oil and gas leases to CRL's is tantamount to issuing a new lease with a 10-year term, it seems inconsistent to convert leases in category 4 areas at all, even with a no-surface occupancy stipulation. Why should applicants be charged for leases on lands where development will never be permitted?

31.38 Page 102, paragraph 1. The impact of Alternative 3 on tar sand resources is said to be the same as Alternative 2, that is, the same amount of tar sand could be developed. If Alternative 3 is believed to offer more protection of other resources, why is Alternative 2 preferred?

31.39 Page 103, paragraphs 3 and 4. Alternatives 2 and 3 are unlikely to avoid displacement impacts to bighorn. The stipulation used applies only to exploration, not development, so the only way bighorn would be protected is if nobody wants to develop a hydrocarbon resource in White Canyon.

31.40 Page 105, paragraph 1. Other major issues for the NPS associated with Circle Cliffs tar sand development involve Glen Canyon National Recreation Area. The canyons of the Escalante drain directly into one of the prime backcountry areas of the park and into the important Escalante River. The potential effects of development on water resources, recreation, and wilderness suitability of parklands would be major issues in this area.

31.41 Page 105, paragraph 3. The use of Burr Trail for commercial development could become a major issue for the NPS if access from the east is ever proposed through Capitol Reef National Park. We would encourage designation of a specified access route to this STSA from the west.

31.42 Page 109, paragraph 4. The figure 675 acres is too low to encompass the watershed areas mapped in Figure 2-19.

31.43 Page 109, paragraph 6. We disagree with the justification presented here for permitting in-situ development in the Capitol Reef watershed areas. As noted in Volume 1, in-situ tar sand development may result in 40 percent (30-50 percent) surface disturbance. By any measure, this level of disturbance would affect a watershed through its discharge characteristics and surface water quality. In-situ development of tar sand has the potential to affect aquifers as well. It is difficult to see how in-situ development in these areas would not affect the Capitol Reef watersheds. In addition to the proposed prohibition on surface mining, which we appreciate and support, the NPS requests an additional prohibition on in-situ tar sand development in the Capitol Reef watersheds, leaving them open to conventional oil and gas only. The following facts also bear on this issue: (1) Most of the two watershed areas under discussion (Figure 2-19) are "areas of potential surface mining" (Figure 2-18) due to shallow overburden or outcropping. The same conditions would probably make large-scale in-situ development impractical anyway: (2) The "park watershed" area in T34SR2E Section 1, which is shown on Figure 2-18 as suitable for in-situ development, is not leased; thus, no existing mineral right would be affected by application of the proposed stipulation to this section.

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31.44 Page 109, paragraph 11. The 20,280-acre NPS/BLM "Canyons of the Escalante Cooperative Management Area" (CMA)-is included in lands proposed in the DEIS for category 2 management. Surface mining, but not in-situ development, would be prohibited. Figure 2-18 does not map tar sand resources in the CMA except along its upper boundary, so evidently the resource is not significant there. We suggest that a stipulation prohibiting both in-situ and surface mine tar sand development in the CMA would be justified by the recreational and watershed values. The action should have minimal effect on the tar sand available while affording added protection to a sensitive area. Additionally, two areas totalling 675 acres have been identified as sensitive watershed for Capitol Reef National Park. We believe similar designation should be applied to the Silver Falls Creek and Hoody Creek drainages of the Escalante arm of Glen Canyon National Recreation Area. Such designation would be consistent with the BLM's natural zone and with BLM's Escalante Canyon Outstanding Natural Area.

31.45 Page 114, "Soils." The distribution of the fragile Moenkopi soils mentioned on page 123, paragraph 5, should be described or mapped.

31.46 Page 122, paragraphs 5 and 6. There would probably be a great deal less impact on water resources from Alternative 4 than from Alternative 3 due to Alternative 4's prohibition of in-situ. This is because of the high surface disturbance factor for in-situ and the subsurface techniques employed.

31.47 Page 124, paragraph 2. Development of the boundary areas of the STSA could significantly affect backcountry/wilderness values in Capitol Reef National Park and Glen Canyon National Recreation Area. This would be true under all of the alternatives, but Alternative 4 would have by far the least effect.

Volume III: Potential Lease Tract Analyses

General Comments:

31.48 The two tracts in the Tar Sand Triangle are included within the proposed operations for tar sand development filed by Santa Fe Energy Co., et. al. This proposal is being evaluated in a separate EIS due for publication in draft in early 1986. The BLM and NPS have not yet selected a preferred alternative regarding the Tar Sand Triangle operations (and thus on the issue of combined hydrocarbon leasing there); therefore, any reference in this document to a preferred "multiple-use" alternative for Gordon Corral and Flint Flat tracts should be deleted (for example, as in Table 2-1). The decision on whether or not these two tracts will be offered competitively in 1986 must be consistent with the pending decision on the unit plan of operations - unless the tracts would be considered for conventional oil and gas leasing only.

31.49 The BLM and NPS have recently developed additional baseline resource information for the Orange Cliffs area of the Tar Sand Triangle. Additional mitigative restrictions on hydrocarbon operations, based on the new information, have been developed for the protection of the natural, cultural, and recreational resources of the NRA. The NPS intends to apply these resource protection measures to all new hydrocarbon leases issued in the NRA, and they would apply to the Gordon Corral and Flint Flat tracts.

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31.49 cont. No surface occupancy of a lease would be permitted in the following sensitive resource areas:

1. Slopes greater than 33 percent.

2. Within 1 kilometer of a raptor site.

3. Within 200 feet on either side of an established visitor access road (Flint Trail in the Orange Cliffs).

4. Within one-half mile of springs, water wells, and seeps.

5. On soils classed by the Soil Conservation Service as being highly susceptible to erosion once disturbed (Begay and Mido soils at Orange Cliffs).

6. Areas visible from three or more visitor overlooks of the NRA.

7. Areas visible from critical overlooks of Canyonlands National Park (Orange Cliffs).

8. Within 1 kilometer of an active eagle nest.

9. Within 1500 feet of a cliff face.

10. On archeological sites or districts proposed to the National Register of Historic Places.

11. Within 1 mile of a visitor contact point (e.g., Hans Flat Ranger Station).

These lease conditions must be added to the list of Special Stipulations for NPS areas in Appendix 2, page 85.

Factors 1, 2, 3, 4, 6, 7, 8, 9, and 10 would come into play on the Gordon Corral and Flint Flat tracts. In combination they would preclude development of the Gordon Corral tract and major portions of the Flint Flat tract. It does not appear feasible to develop either tract on its own.

31.50 We recommend that the Gordon Corral and Flint Flat tracts be deleted from Alternative 1 because it is not reasonable to consider them maximum development candidates with the special stipulations applied.

The NPS supports Alternative 4, the BLM's preferred alternative designated in the DEIS. This involves leasing tracts in the Sunnyside and Farlette STSA's, two of the areas having the least potential for affecting park units.

31.51 The initial description of Gordon Corral and Flint Flat tracts (pages 16 and 17) should include a more detailed presentation of the regulatory constraints on leasing in units of the National Park System such as Glen Canyon National Recreation Area. Both tracts are within the NRA and would be governed by

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31.51 cont. regulations in 43 CFR 3141.6-2 and 43 CFR 3109.5-2(e). These rules provide that: (1) CSU's in the recreation area cannot be issued without the consent of NPS; (2) such consent must be based on a specific finding that leasehold activities would have no significant adverse impact on NRA resources and administration; (3) leases shall be subject to conditions prescribed by the NPS to protect the surface and significant resources, and to preserve the value of the land for public recreation; (4) approval of lease operations are subject to NPS concurrence. These rules should also be noted as appropriate in the first two paragraphs of Appendix 2.

The NPS cannot complete its site-specific impact analysis of tar sand development in the Orange Cliffs - including Gordon Corral and Flint Flat - until the Final Environmental Impact Statement on the Tar Sand Triangle Plan of Operations is completed in 1984; the Agency will not be in a position to consent to or deny leasing of Gordon Corral or Flint Flat until then.

Specific Comments:

31.52 Page 5. Table 1 presents a summary of environmental consequences for the various alternatives. Even though air quality was earlier identified as an unresolved issue, it and visibility should be included in this table because of the potential magnitude of the impacts identified in Volume I.

31.53 Pages 25, 31 and 55. The EIS should recognize that the Tar Sand Triangle soils described as Lithic Ustollic Calciorthids are identified as rare in the United States (Glen Canyon National Recreation Area General Management Plan Draft EIS, 1977).

31.54 Page 33, "Tar Sand." The tract evaluation completed by Minerals Management Service in October 1982, rated Gordon Corral and Flint Flat as "subeconomic." This should be mentioned here.

31.55 Page 37. How was the determination made that the bighorn sheep habitat on these tracts is "limited value?" No mention is made of the expansion of the Canyonlands herd into the area, or the habitat similarities between areas just to the east, in Canyonlands National Park, where the bighorn sheep appear to be thriving. Also, no mention is made of the State of Utah's program for reestablishing desert bighorn in the area.

31.56 Page 40. Hunting is also an important recreational use of these tracts within the Tar Sand Triangle STSA (mule deer occur in the area).

31.57 Page 51, "Cultural Resources." There is now considerable data on the cultural resources of Flint Flat and Gordon Corral Tracts. Both tracts overlap sections of the proposed Orange Cliffs Multi-Resource National Register Property (mentioned in Volume 1), which consists of areas of the Orange Cliffs where significant cultural resources are known. Tar sand development on these tracts might have significant cultural resource impacts.

31.58 Pages 55-56. The types and amounts of soils and vegetation that would be disturbed should be given for Gordon Corral and Flint Flat. We believe these areas would be very difficult to reclaim once disturbed.

31.59 Page 59, paragraph 8: With what is known about the duration and the amount of disruption due to tar sand development, it is doubtful whether recreational values could be restored within the area within "several years." Given the poor reclamation potential of the area and the types of vegetation that predominate on the mesas, recreational use would not only be precluded during actual operations, but the recreational value of the tracts would be greatly altered for an estimated 70 years more, until mature stands of pinyon-juniper can be reestablished. Also, no quantification of noise impacts (which are likely to substantially affect the quality of recreation experience in the area) is provided.

31.60 Page 77. Table 2-5 should read Table 2-2.

31.61 The remaining discussions of the "affected environment" and "environmental consequences" pertaining to Gordon Corral and Flint Flat will be affected by the factors noted in the above comments (new baseline data, incomplete impact analysis). We recommend that BFS and BLM staff jointly rewrite this material for the final EIS to ensure consistency.

We appreciate the opportunity to comment on this draft EIS and look forward to future coordinating efforts in managing tar sand resources to meet Agency mission requirements.

Lorraine Montgomer

L. Lorraine Montgomer

31.1 The purpose of this EIS is to analyze the environmental impacts of development of the tar sand resource under a range of alternatives. It is not within the scope of the EIS to set regional production quotas or targets.

31.2 In response to your comment, the following table was compiled to show applicants, acres, and type of mining anticipated by STSA.

Name of Applicant	Acres of Lease(s)	Type of Mining (In Situ or Surface)
Raven Ridge/Rim Rock		
John Trig Drilling	152.23	Surface
W. C. Kirkwood Oil & Gas Expl. & Dev.	640	In Situ
Tar Sand Triangle		
Morton M. Pepper	1,280	In Situ
Maurice W. Brown	440	In Situ
Sohio Shale Oil Co.	3,496	In Situ
W. C. Kirkwood Oil & Gas Expl. & Dev.	42,175.16	In Situ
Tar Sand Triangle Unit Plan		In Situ
Santa Fe Energy Co.	19,441	
Altex Oil Corp.	12,689	
Benson-Montin Greer Drilling Corp.	3,345	
Raymond N. Joeckel	1,541	
Sun Expl. Co., Southland Royalty	3,960	
John M. Beard	800	
Hawthorne Oil Co., et al.	1,720	
Texaco, Inc.	211	
Circle Cliffs		
William C. Kirkwood	50,217	In Situ
Asphalt Ridge/White Rocks		
F. M. Tully & Rocky Mtn. Expl. Co.	720	Surface
San Rafael Swell		
Richard J. Valentine	160	In Situ
Dorothy Largley	640	In Situ
W. C. Kirkwood Oil & Gas Expl. & Dev.	2,078	In Situ

Name of Applicant	Acres of Lease(s)	Type of Mining (In Situ or Surface)
P.R. Spring		
Mobil	1,837.1	Surface
Texaco	1,180.5	Surface
Beartooth Oil & Gas Co.	1,189.19	In Situ
Beartooth Oil & Gas Co.	1,120.37	In Situ
Walter Duncan Oil Properties	1,600	In Situ
J. C. Thompson	74.48	In Situ
F. J. Bradshaw Estate	320	In Situ
Bill D. Farleigh, et al.	640	In Situ
Ensearch Expl., Inc.	1,080	In Situ
Enercor	40,000+	Surface
Hill Creek		
W. C. Kirkwood Oil & Gas Expl. & Prod.	3,907.51	In Situ
Pariette		
Ensearch Expl., Inc.	479	In Situ
Sunnyside		
Ensearch Expl., Inc.	2,889.95	In Situ
Sunnyside EIS		Surface and In-Situ
Sahine Energy	7,240	
Mono Power Co.	9,836	
Amoco Prod. Co.	9,602	
Chevron USA, Inc.	160	
Enercor	1,350	

31.3 Site-specific EISs, based on plans of operations with specific time frames for development, have been written for Sunnyside and Tar Sand Triangle STSAs. No EAs or EISs have been developed for the nine remaining STSAs, although some are being initiated in 1984. As a result, the Regional EIS had to analyze impacts based on sets of assumptions. So that impacts between STSAs could be compared, it was decided to base analyses in the Regional EIS on a 20-year time frame for all STSAs.

31.4 The text has been amended to read that Dinosaur and Colorado national monuments have been recommended for Class I redesignation. Volume I, Chapter 3, Air Quality and Climate section acknowledges that the portion of Dinosaur National Monument within Colorado and Colorado National Monument are Colorado Category I areas, having SO_2 standards similar to Federal Class I. The modeling analysis did

Response Letter 31

give special attention to these areas, including consideration of visibility impacts. For additional details, see the "Air Quality Analysis for the Combined Hydrocarbon EIS, Eastern and South-Central Utah" completed by Aerocomp, Inc. (1983a).

31.5 BLM has entered into informal consultation with FWS pursuant to the Endangered Species Act, and is coordinating with FWS under the Fish and Wildlife Coordination Act. Through this coordination, provisions have been made to ensure protection of threatened and endangered species from impacts associated with tar sand development. Refer to Volume 1, Chapter 4, Threatened, Endangered, and Sensitive Plant and Animal Species sections of this Final EIS for a summary of measures taken between the two agencies thus far. The purpose of consultation with the FWS is to prevent any loss of threatened and endangered fisbes in any area, including Dinosaur National Monument.

31.6 The degree of quantification you propose is not possible because of the lack of specific proposals. When such proposals are received, they will undergo, where appropriate, a site-specific environmental analysis that should reveal those areas that could experience overutilization of recreation sites. The text has been revised in Volume I, Chapter 4, Alternative 1 (Regional Overview), Recreation section, to include additional data on recreational uses.

31.7 These unresolved issues involve many ramifications which are the perview of others and, therefore, are not within the capability of BLM to resolve.

31.8 A more detailed description of upgrading facilities for hitumen produced from in-situ recovery has been added to Volume I, Chapter 2, Description of Bitumen Recovery Process section.

Existing pipelines and refineries are shown on the "Energy Resource Map of Utah" (Utah Geological and Mineral Survey, 1983). Pipelines to carry hydrocarbon from any proposed tar sand processing facilities to refineries have been addressed in Volume I of this EIS. It is anticipated that any hydrocarbon produced through the pilot plant pbase will be trucked to the nearest refinery. Once a feasible production level is determined for each processing facility (from data obtained through the pilot plant phase), the feasibility of a pipeline to carry the produced hydrocarbon will be evaluated. This evaluation and an assessment of the impacts associated with any proposed pipelines will be analyzed, where appropriate, in EAs or EISs prepared for the specific action.

31.9 This information is not a summary item. However, Volume I, Chapter 3, Air Quality and Climate section of this Final EIS has been amended to read that a portion of the Tar Sand Triangle STSA extends into Canyonlands National Park, a Class I air quality area.

31.10 The acreage has been corrected in Volume I of this Final EIS. The acres of the Circle Cliffs STSA within Capitol Reef National Park total 30,720. The total acreage of BLM lands within the Circle Cliffs STSA is 50,760. In the "Federal Acreage" column in Volume I,

Table 2-1, BLM- and NPS-administered acreages are now shown on separate lines.

31.11 Chapter 4 analysis reflects these nationally significant scenic and recreational values in this Final EIS. Hans Flat is correctly spelled in Volume 1, Chapter 3.

31.12 The information has been added to Volume I, Chapter 3, Wilderness section, in this Final EIS.

31.13 The text has been revised in Volume I, Chapter 3, Visual Resources section of this Final EIS.

31.14 Refer to Letter Response 2.11.

31.15 Complete visibility data is provided in Table 5-7 of the air quality technical report prepared by Aerocomp, Inc. (1983a). Also, refer to Letter Response 15.13.

31.16 The heavy truck and commuter traffic analysis for each STSA for the high level production scenario can be found in Volume I, pages 123-124 of the Draft EIS. The comparable analysis for the low production scenario is found on pages 163 and 165.

31.17 Volume I, Table 4-1, Alternative 1, Air Quality Impacts Within STSAs has been corrected to show Colorado National Monument as having significant visibility impacts from tar sand development in the P.R. Spring STSA.

31.18 Cumulative concentrations and increment consumptions of other proposed projects are included in Volume I, Tables 4-2, 4-3, 4-15, 4-16, and 4-27 of this Final EIS. For a more detailed discussion of interrelated projects, see the regional air quality technical report prepared by Aerocomp, Inc. (1983a).

31.19 Proposed development at Asphalt Ridge/White Rocks STSA is expected to occur at the extreme northwest section of the STSA--approximately 50 km (31 miles) from Dinosaur National Monument. Proposed development in Raven Ridge/Rim Rock STSA is expected to occur approximately 25 km (15.5 miles) from Dinosaur National Monument. Maximum NO_2 impacts at both STSAs would occur in the immediate vicinity of the facilities. Additive impacts from these facilities would range from 1 to 5 ug/m^3 at Dinosaur National Monument. Impacts to the Monument from the interrelated sources in the area (Plateau Refinery, Magic Circle, Paraho, Syntana, Tosco, Sohio, White River Oil Shale, and Moon Lake power plants) are expected to contribute an additional 5-10 ug/m^3. Thus, no adverse impacts would occur at Dinosaur National Monument from the proposed development.

31.20 This EIS is written for a 20-year time span which does analyze the cumulative impacts associated with initial exploration and development of the tar sand resource. Where appropriate, site-specific EAs or EISs will analyze the impacts of the proposed actions and alternatives for the lives of the proposed projects.

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31.21 The information is discussed in Volume I, page 113 of the Draft EIS.

31.22 Refer to Letter Response 31.5.

31.23 Volume I, Chapter 4, Alternative 1, Visual Resources sections for Circle Cliffs and Raven Ridge/Rim Rock STSAs have been amended to include this additional information.

31.24 Volume 1, Cultural Resources is a regional overview and is generic. Archaeological sites within the Tar Sand Triangle STSA are listed in Volume I, page 67 of the Draft EIS.

The discussion of cultural resource impacts was inadvertently left out of the Alternative 2 analysis: the text in Volume I of this Final EIS has been revised to include this discussion.

31.25 Volume I, Table 4-8 has been corrected in this Final EIS.

31.26 For analysis purposes, the EIS assumed the most direct routing from all STSAs, using existing transportation modes to existing refineries. The transportation analysis acknowledges the impacts in the comment. However, applicants can propose alternative routing when they submit plans of operations.

31.27 Volume 1 uses production estimates provided by industry and assumes a reasonable development methodology as understood at this time. Volume II proposes categories for issuing new leases or converting existing oil and gas leases to CMLs. This volume is a planning amendment document that considers a wide range of development possibilities.

BLM geologists believe that there is some possibility for surface mining of tar sand on part of the Circle Cliffs STSA. The analysis should include category restrictions to protect other resources should such mining be proposed.

Surface mining would produce greater air quality and visibility impacts than would in-situ extraction.

31.28 Soil erosion and sedimentation problems would be minimized by implementing stipulations as discussed in Volume 1, Appendix 2, Surface Disturbance Stipulations For Combined Hydrocarbon Leases section and Special Stipulations section. The areas of potential surface mining are all in sediment yield Class 4, as shown in Volume II, Figure 2-18. Class 4 has a yield rate of 0.2 to 0.5 acre-feet/square mile/year (refer to Volume I, Table 3-9). Also, refer to Letter Response 28.2.

31.29 Refer to Letter Responses 14.10 and 14.11.

31.30 The areas identified in the EIS as being potentially suitable for surface mining within the Tar Sand Triangle are all located within the BLM portion of the STSA (Hatch Canyon and Cove Canyon areas). Even though areas with the most potential for a strip mine operation are located within the Glen Canyon NRA, these areas were not analyzed for strip mining because of stipulations which prevent

development, as noted in Volume III, Appendix 2. A change in Volume 1, Chapter 4 of this Final EIS was made to clarify this point.

31.31 The first sentence under the Volume I, Water Resources heading (page 139 of the Draft EIS) states that water could be supplied from the Green, Colorado, or Dirty Devil rivers. However, to add emphasis, the word "directly" has been added. The text of this Final EIS now reads: "Water...could be supplied directly from the Dirty Devil River."

31.32 The comment will be considered during the decision-making process for amending leasing categories in Volume II.

31.33 Volume I, Table 4-20 has been corrected in this Final EIS.

31.34 The large foldout map located in the back of Volume I of this Final EIS portrays, in color, NPS lands. Also, the inaccuracies in Volume 1, Summary have been corrected.

31.35 Although the tar sand resource could be developed under each alternative in the STSAs referred to, the amount of resource and conditions under which it could be developed vary widely between alternatives. Note that acreage under category 1 in the White Canyon STSA ranges from 7,805 acres in Alternative 1 to 1,924 acres in Alternative 3. Placing acreage in categories 2, 3, and 4 would provide real protection and provides the decision-maker with a range of alternatives.

31.36 Air quality impacts to Dinosaur National Monument have been added to the list of major issues in Volume II, Summary and Chapter 2.

Tar sand development in the Asphalt Ridge/White Rocks STSA is expected to occur in the extreme northwest corner of the STSA, approximately 50 km (31 miles) from Dinosaur National Monument. The air quality analysis did not project significant impacts to the National Monument. Although the level-1 visibility analysis suggested a potential for adverse visibility impacts at the National Monument, the more detailed level-2 analysis did not substantiate this conclusion.

31.37 Any lease conversions in proposed category 4 areas would be issued as category 3. By issuing a lease in category 3, the leaseholder would be able to maintain that lease and, should proper technology later be developed, would have maintained the right to development. Also, it is possible that other parts of the lease in a different category could base development in those areas. It should be noted that the leaseholder has a right to develop oil and gas on existing leases.

31.38 The original analysis was in error. Volume II, Chapter 2, Tar Sand Resources section for the White Canyon STSA has been rewritten to indicate that mining activities would be limited on 874 more acres than under Alternative 2.

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31.39 The seasonal stipulation regarding bighorn sheep lambing and rutting grounds would apply to exploration. However, the comment is correct in stating that Alternatives 2 and 3 are unlikely to avoid displacement impacts to bighorn sheep because mining could occur in the entire area. The Final EIS has been corrected to read: "This alternative (Alternative 2) could reduce but not eliminate displacement impacts to bighorn sheep."

31.40 Volume II, Chapter 2, Circle Cliffs STSA section of this Final EIS has been amended to include this information.

31.41 Refer to Letter Response 31.26.

31.42 The text was in error; Figure 2-19 shows the entire sensitive watershed under category 2: 3,480 acres. This figure has been corrected in Volume II, Circle Cliffs STSA, Alternative 2 description in this Final EIS.

31.43 Surface disturbance from tar sand development would be subject to the stipulations described in Volume II, Appendix 1, Surface Disturbance Stipulations for Combined Hydrocarbon Leases section. Stipulations include erosion control measures and methods of retaining all mine drainage and runoff on site. Aquifers would require protection as discussed in Letter Response 24.7. Alternatives 3 and 4, analyzed in Volume II, would not allow development of tar sand within the watershed areas near Capitol Reef National Park. The present NFP would not protect those areas nor would the maximum development alternative offer protection. The multiple-use alternative would allow in-situ development.

31.44 The suggestions in the comment will be considered in the decision-making process.

31.45 Volume II, Visual Resources section (page 123 of the Draft EIS) makes reference to "fragile Moenkopi-derived soils" (soils derived from the Moenkopi Formation). No detailed soil map is presently available for use in delineating these soils within the Circle Cliffs STSA. Refer to Volume II, first paragraph of the Soils section (page 114 of the Draft EIS).

31.46 Less area would be available for tar sand development under Alternative 4 than for Alternative 3. This would afford additional protection to the water resource on 14,480 acres where in-situ development was restricted.

31.47 The comment substantiates the analysis in Volume II, page 124 of the Draft EIS.

31.48 Volume III, Table 2-3 has been amended in this Final EIS.

31.49 Thank you for your comment. The additional resource protection criteria have been added to Volume III, Appendix 2 of this Final EIS, which contained the NPS stipuations.

31.50 Alternative 1 analyzes the maximum amount of development that might conceivably be allowed in the "first round" lease sale. Even in the maximum development alternative, Flint Flat and Gordon Corral tracts would be offered, subject to the stipulation in Volume III, Appendix 2. Therefore, it is appropriate to consider those two tracts, as stipulated, a part of the maximum leasing alternative.

31.51 The text has been revised in Volume III, Chapter 2 to include these regulatory constraints.

31.52 Volume III, Summary Table 1 and Table 2-2 have been amended to include an air quality impact analysis.

31.53 Lithic Ustollic Calciorthid soils are rare in the United States (U.S. Department of Agriculture [USDA], Soil Conservation Service [SCS], 1975), but are extensive on upland mesas, plateaus, and mountain slopes throughout eastern, southern, and southwestern Utah (Wilson et al., 1975). Volume III, Table 3-3 (page 31 of the Draft EIS) lists these soils.

31.54 It is not the Department of Interior's policy to decide whether or not the development of a resource is economical. The Department's concerns are limited to making the resource available in an environmentally sound manner. The market place is the best place to make such economic decisions.

31.55 The data used in the Draft EIS regarding bighorn sheep habitat on the Flint Flat tract were provided by UDWR (1980). It is more likely that the herd would expand into The Maze area of the Park; therefore, a discussion of the State's plan to reintroduce sheep in the area was omitted.

31.56 Known hunting use in the STSA is negligible due to the small numbers of game animals, including mule deer, present. Therefore, this use was not discussed in the EIS.

31.57 The cultural resources present in these two tracts are discussed in Volume III, Chapter 3. There should be no impacts to cultural resources if the mitigation in Appendix 2 is applied properly. See also the Cultural Resources Memorandum of Understanding in Appendix 5.

31.58 The vegetation on these two tracts and the expected impacts are characterized in general in Volume III (page 34 of the Draft EIS). Industry has submitted a plan of operations for Gordon Corral and Flint Flat tracts. An EIS is currently in progress and is being prepared jointly by NPS and BLM. This EIS will contain a site-specific, detailed description of the existing environment and an analysis of impacts to vegetation in the general area.

31.59 The text in Volume III, Chapter 4 in this Final EIS, has been amended to reflect the comment. If soils and/or contour characteristics were altered, there could be permanent alteration of present composition and cover. Recreational impacts would include a reduction of visitor satisfaction caused by modification of naturalness and possibly impaired scenic values. The extent would depend on the specific site, design, construction, operation, and rehabilitation.

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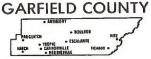
31.60 This error has been corrected in Volume III of this Final EIS.

31.61 Coordination between BLM and NPS has been and will continue to be carried out. An NPS representative participated in the review of the Preliminary Final EIS.

Comment Letter 32

COUNTY COMMISSION
George Middleton, Chairman
Guy W. Thompson
M. Dell LeFevre
Lenora Barney, Clerk

GARFIELD COUNTY



PANGUITCH, UTAH 84759

Tom Simkins, Assessor
Patrick B. Nolan, Attorney
Mamie O. Hatch, Recorder
Merle Stovell, Treasurer
Vic Middleton, Sheriff
John W. Yardley, Justice of the Peace

January 18, 1984

State Director
Bureau of Land Management
Utah State Office
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Sir:

The Garfield County Commission has reviewed the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement (EIS) prepared by the Bureau of Land Management. In general, we agree that the BLM has done an acceptable job in analyzing the alternatives. The Garfield County Commission supports the Low Commercial Production Alternative. This alternative allows a moderate level of production with the ability to sufficiently mitigate environmental impacts.

We have the following specific comments:

32.1 1. Employment and Income, Volume I, Chapter 3, Page 74; the unemployment trends in the region should be depicted to show the long-term and seasonal economic stress in the labor force. During the winter months of 1982-1982, Garfield County experienced employment rates near 20 percent.

32.2 2. Garfield County School District, Volume I, Chapter 3, Page 82; The Garfield County School bond initiative for 6 million dollars was defeated; therefore the building program has been deferred indefinitely.

32.3 3. Garfield County Public Safety, Volume I, Page 78. Law Enforcement in Garfield County consists of one sheriff and three deputies. One deputy is assigned to the eastern portion of the County, and one deputy is permanently assigned to the City of Escalante. Response times to Escalante and Boulder are therefore much quicker than the 1 hour and 13 hours as indicated in the EIS.

Sincerely,

George Middleton
Chairman

dl

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32.1 This information has been added to Volume I, Chapter 3, Socioeconomics section in this Final EIS. This Regional EIS, covering the statewide tar sand resource, has been designed to provide only an overview socioeconomic analysis. A more site-specific approach relating to Garfield County and the surrounding area labor force will be contained in the Draft EIS, "Unit Plan of Operations for Tar Sand Triangle Combined Hydrocarbon Lease Conversion, Utah", now in progress by the NPS and BLM.

32.2 This information has been added to Volume I, Chapter 3, Socioeconomics section in this Final EIS.

32.3 This information has been included to Volume I, Chapter 3, Socioeconomics section in this Final EIS.

Comment Letter 33

Rocky Mountain Oil & Gas Association, Inc.

Jack G. Swenson
Executive Vice President
and General Manager

345 PETROLEUM BUILDING • DENVER, COLORADO 80202
303 534-8261

January 27, 1984

Mr. Roland Robison
State Director
Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, UT 84111

Dear Mr. Robison:

The Rocky Mountain Oil and Gas Association is a trade association whose members account for more than 90% of the exploration and production of oil and gas in the eight-state region it serves. Many of its members are active in the development of the tar sands resources in the State of Utah and accordingly are vitally affected by the Utah Combined Hydrocarbon Regional Draft Environmental Impact Statement issued by the BLM in November 1983. RMOGA therefore considers it appropriate to express concerns over certain of the conclusions and other aspects of the draft EIS which will significantly affect the development of a viable, competitive tar sands
33.1 industry. It should first be emphasized that RMOGA's position is that combined hydrocarbon lease conversions are specified by statute to require a plan of operations that provides only for (1) diligent development, and (2) reasonable protection of the environment. The conversion of the lease itself does not involve any environmental impact and therefore does not require an EIS. RMOGA's comments will be principally addressed to the major considerations of the draft EIS. Comments regarding specific projects will be addressed separately by individual member companies.

33.2 In general, the draft EIS adopts a restrictive position on tar sands development in Utah. It employs highly uncertain data on a deterministic, worst case basis. Such a methodology misrepresents the nature and level of impact which may result from development. It effectively precludes the development of innovative mitigation strategies which can provide for both economic resource development and reasonable protection of the environment. This approach is unsupportable with a technology such as tar sands which is in the early stages of resource characterization and technology development.

A more supportable approach is one which defines the type and level of impacts which may result with current and projected technologies and the level of

Comment Letter 33

33.2 cont. uncertainties associated with these impacts. Worst case analysis should only be employed on a basis of reasonable probability as proposed by the Council on Environmental Quality in August 1983. Based on such analysis, only those unacceptable, adverse impacts which are reasonably expected to occur and are clearly incapable of mitigation should operate to preclude or restrict development. Other impacts which are considered unacceptably adverse, require mitigation and are susceptible to the development of effective mitigation strategies by developers should be subject to special stipulations which require review and approval of mitigation measures at the time of permitting and prior to commencement of detailed development. Such an approach would suggest selection of Alternative 1, Maximum Development for leasing category amendments and Alternative 1 for competitive leasing, both with appropriate special review stipulations, as the preferred alternatives.

33.3 The analyses presented in the draft EIS tend to emphasize the adverse impacts of development and understate the benefits which can result from development. This approach biases the EIS against development. A more balanced approach which attempts to compare benefits with impacts is necessary to provide a fair and reasonable basis for public understanding and decision analysis.

33.4 Finally, the Alternative 1, High Commercial Production described in Volume 1 is considered substantially in excess of any reasonable development scenario in consideration of projected economic and technical considerations. The use of such projections results in substantial overstatement of impacts likely to develop in the time frame considered. This in turn results in a bias against development and misperceptions by the public and decision makers. A more realistic high production scenario should be employed to fairly represent reasonable development. Such considerations as duplication of development by individual producers in the Sunnyside STSA should be resolved.

Thank you for the opportunity to comment on the draft EIS. We hope that our comments will be helpful in developing a fair and reasonable tar sands management and leasing program by the BLM.

Sincerely,

Jack Swenson

JS/par

Response Letter 33

33.1 It is assumed that a lease will be developed if it is issued. Based on this assumption, reasonable protection of the environment must be documented, where appropriate, by an EA or EIS. Consequently, a lease conversion cannot be offered without an environmental assessment.

33.2 It should be pointed out that BLM will not be making any selection of production levels. BLM's responsibility is to convert and/or issue new leases to leaseholders who provide acceptable plans of operations with proposals which reasonably protect the environment. The purpose of Volume I of this Regional EIS is to provide a cumulative analysis of potential impacts, including a worst-case situation.

The "level of certainty" (i.e., level of development) is highly variable because of the amount and method of development leaseholders could propose in their plans of operations. The EIS is based on the best information available at this time, including technology.

33.3 Refer to Letter Response 18.1.

33.4 Refer to Letter Response 18.2.

Comment Letter 34

United States Department of Agriculture — Forest Service — Intermountain Region — 324 25th Street Ogden, UT 84401

Reply to: 2800 (1950)

Date: JAN 30 1984

Mr. Roland G. Robison, Jr.
Utah State Director
Bureau of Land Management
136 East South Temple
Salt Lake City, UT 84111

Dear Roland:

The following are our comments/suggestions on the three volumes of the Draft Regional Environmental Impact Statement for the Utah Combined Hydrocarbon Leasing program.

34.1 Many of our specific questions relate to one general concern: to what extent does this analysis involve National Forest System lands? We are particularly interested in two areas, the Argyle Canyon/Willow Creek and Asphalt Ridge/White Rock Special Tar Sand Areas (STSA). Several maps and minor portions of narrative descriptions infer that National Forest System lands are involved, yet impacts on the National Forests are not fully evaluated. If National Forest System lands are not involved, this should be clearly stated. If National Forest System lands are involved, more Forest data needs to be incorporated.

34.2 In regards to this general situation, no mention is made of the status of the Ashley National Forest's involvement in an environmental assessment for lease U-13790 within the White Rocks portion of the Asphalt Ridge/White Rocks STSA. Your letter of December 6, 1983, requests our recommendations on this lease conversion. This tract should be addressed since it is within the boundaries described in the Draft EIS.

Some of the following specific comments may not be applicable after these major concerns are clarified.

General Comments - Volume I

34.3 1. The map location of the Argyle Canyon/Willow Creek STSA indicates that several sections and parts of sections of National Forest System land (Ashley NF) are located in this STSA; therefore, it should have been included in the Regional Analyses. The Analyses, of course, should address all resources and resource values as presently included in EIS Volumes I and II, as they apply to the National Forest System lands involved in the STSA.

34.4 The Forest Service will, upon request, supply resource information that is in addition to or different than the data base used for the Argyle Canyon/Willow Creek STSA. Several of the following specific comments address resources and

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34.4 cont. values that were clearly missing from the analyses. Additional data gathering and analysis work is needed to adequately represent on-the-ground features, uses, and users.

Specific Comments - Volume I

34.5

Page	Column	Paragraph	Line
11	left	last	last

The Ashley National Forest is also performing site-specific environmental assessment work on a conversion application in the Asphalt Ridge/White Rocks STSA. This should be so stated.

34.6

Page	Column	Paragraph	Line
11	right	first full	last

Need to explain difference between conversion and potential lease tracts.

34.7

Page	Column	Paragraph	Line
12 and 13	left Table 1-1	2	

Table 1-1 should breakout Bureau of Land Management, Forest Service, National Park Service, state, and private acreages of land by STSA.

The pocket map located at the back of Volume I should also depict National Park Service and Forest Service lands within each STSA.

Adherence to these comments would facilitate reviews, i.e., most reviewers are interested in knowing ownership and/or land administrative responsibilities and such reviewers key into specific concerns based on landownership and/or responsibilities.

34.8

Page	Column	Paragraph	Line
30	Table 2-4	Environmental Element	Animal Life

The word "Possible" should be taken out of the discussion of habitat loss and degradation. Based on the extent of surface disturbance associated with the surface mining proposals, probable losses and degradation would occur. Rehabilitation will be a long-term activity and reductions in wildlife numbers will be the norm for disturbed areas.

34.9

Page	Column	Paragraph	Line
40	Table 3-5	Streams	San Rafael Swell

Under "Uses," the streams and reservoirs west of the STSA are also used as domestic water sources. Refer to Uinta-Southwestern Coal Region, Round II EIS

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34.9 cont. for a complete discussion of this use by drainage. Table 3-27, page 88 of Volume I, also indicates domestic use of streams.

34.10

Page	Column	Paragraph	Line
58	right	Argyle Canyon/Willow Creek	1

According to the map location of this STSA, the Ashley National Forest's Avintaquin Campground is located in a portion of the STSA. (Refer to Pocket Map, Volume I). The developed site is located in SW¼SW¼ Section 10, T. 11 S., R. 10 E.

You will need to include an appropriate discussion for this site in Chapter 4, Environmental Consequences.

34.11

Page	Column	Paragraph	Line
65	right	Land Use Plans	

Revise to include mention of the controlling land use plan for National Forest System lands in the Asphalt Ridge/White Rocks STSA. The Plan is entitled, South Slope Land Use Plan, dated 1979. Plan direction is administered by the Ashley National Forest. This plan emphasizes recreation and scenic values and the management of all resources to protect these values. Mineral resources are to be managed on a case-by-case basis as one of the multiple uses within the area.

Also should mention management direction for National Forest System lands in the Argyle Canyon/Willow Creek STSA. This area is not covered by an existing land use plan. The resource management is directed by a multiple use plan which emphasizes watershed, wildlife, and livestock grazing values.

All National Forest System lands within the Ashley National Forest are currently being reevaluated and a new Forest Land and Resource Management Plan is being prepared. This plan will strengthen or redefine management goals, objectives, and guidelines included in existing land use plans or multiple use plans. These goals, objectives, and guidelines will address all biological and social resource values within and adjacent to the National Forest boundary. The new plan may identify Combined Hydrocarbon Leasing Impacts to National Forest resources using the Utah Combined Hydrocarbon Regional and Site-Specific Analyses as a basis. (Existing Forest plans do not identify such uses or impacts.)

34.12

Page	Column	Paragraph	Line
67	right	Livestock Grazing	

Mention should be made of Forest Service Grazing allotments in the Asphalt Ridge/White Rocks and Argyle Canyon/Willow Creek STSAs. Table 3-17 on page 68 should also list these allotments.

Argyle Canyon/Willow Creek STSA within the Forest occupies portions of the Mill Hollow and Tub Ridge Cattle Allotments. Permitted numbers on these two

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34.12 cont. allotments are 9 head of cattle for 3 months and 55 head of cattle for 3 months, respectively.

Asphalt Ridge/White Rocks STSA within the Ashley National Forest occupies portions of the White Rocks, Mosby Mountain, and J. Schulthes Cattle Allotments. Permitted numbers on these three allotments are 50 head of cattle for 3 months, 351 head for 3½ months and 10 head for 2 months, respectively.

34.13

Page	Column	Paragraph	Line
113	right & left	Recreation	

Mention should be made of increased recreation use that would occur on adjacent Bureau of Land Management, National Forest, state, and private lands. Displaced uses on the project areas, as well as increases in county population, would be the cause. Displaced recreation users would seek recreation opportunities similar to those lost. New county residents would look for existing semiprimitive recreation opportunities. In general, all recreation activities eliminated by lease operations would eventually be shifted to adjacent Bureau of Land Management, National Forest, state, or private lands.

Similar statements should be included on page 30, Table 2-4 of Volume 1.

34.14

Page	Column	Paragraph	Line
114	right	Livestock Grazing	3

Change ". . .one Forest Service (FS) allotment. . ." to ". . .five Forest Service (FS) allotments. . ." (Refer to comment for page 67, Livestock Grazing.)

34.15

Page	Column	Paragraph	Line
126	right	Livestock Grazing	

Refer to comment for page 67, Livestock Grazing. The STSA has the potential of affecting three Forest Service cattle allotments. The impact analysis should address potential AUM losses due to tar sand development.

34.16

Page	Column	Paragraph	Line
127	right	Livestock Grazing	

Portions of three Forest Service cattle allotments are located in the National Forest area of the STSA. (Refer to comment for page 67, Livestock Grazing.) Potential AUM losses due to tar sand development should be recalculated. Table 3-17 on page 68 will need to be corrected.

34.17

Page	Column	Paragraph	Line
156	left	Livestock Grazing	3

127

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34.17 cont. Refer to comment for page 67, Livestock Grazing. The Asphalt Ridge/White Rocks STSA has the potential of affecting three Forest Service cattle allotments. Potential AUM losses should be recalculated.

34.18

Page	Column	Paragraph	Line
167	left	Livestock Grazing	

Refer to comments made for pages 67, 114, 126, and 127 on Livestock Grazing.

34.19 General Comments - Volume II

1. Forest Service comments, requesting changes to various sections of Volume I, will require appropriate and corresponding changes in Volume II. Corrections will need to be made to account for, (1) Forest Service allotment and AUM numbers in the Argyle Canyon/Willow Creek and Asphalt Ridge/White Rocks STSAs, (2) the Forest Service developed recreation site located in the Argyle Canyon/Willow Creek STSA, (3) existing land use plans or multiple use plans and plan directions for the aforementioned STSAs, (4) Federal rights-of-way on National Forest System land within the STSAs, and (5) any additional resource analyses resulting from evaluation of National Forest System lands within the STSAs.

2. If the Argyle Canyon/Willow Creek STSA map locations are correct and do include the Forest Service Avintaquin developed recreation site, the Forest Service will need to be contacted for development of and concurrence with special stipulations.

3. Our preferred alternative for the STSAs directly affecting National Forest System lands would be that of "Multiple Use," with special stipulations as outlined for BLM administered lands (where applicable) plus additional stipulations to protect developed recreation sites and watershed values.

34.20 General Comments - Volume III

1. Should the conversion of oil and gas lease U-26244 located in the Asphalt Ridge/White Rocks STSA be considered as potential lease tract? The Ashley National Forest is presently performing site-specific environmental assessment work on a conversion application for this STSA. It appears that this application (expression of interest) would necessitate inclusion of the lease area in the Volume III analysis.

34.21 Specific Comments - Volume III

Page	Column	Paragraph	Line
1	left	1	11

Should the phrase ". . .whichever is later. . ." read instead ". . .whichever is earlier. . ."

Please contact us if we can be of assistance in resolving these questions as you prepare the Final Environmental Impact Statement.

Sincerely,

for J. S. TIXIER
Regional Forester

Response Letter 34

34.1 The Aspbalt Ridge/White Rocks and Argyle Canyon/Willow Creek STSAs contain National Forest lands. Additional information regarding these lands has been added to this Final EIS, and National Forest lands appears in color in the pocket map located in the back of Volume I of this Final EIS.

34.2 The EIS does assess the potential effects of individual lease conversions at a regional level, including affected National Forest lands. Mention of the EA for the White Rocks portion of the Asphalt Ridge/White Rocks STSA has been made in Volume I, Chapters 1 and 4 of this Final EIS.

34.3 The analysis in Volume I of this Final EIS now specifically discusses those portions of the Argyle Canyon/Willow Creek STSA on National Forest lands. Volume II addresses only land use planning amendments for BLM lands and does not include an assessment for National Forest lands.

34.4 The text has been changed and figures corrected in Volume I of this Final EIS in response to the comments. Continuous consultation is maintained with Forest Service (FS) resource specialists to more accurately assess impacts to National Forest resources.

34.5 Volume 1, Chapter 1, Purpose and Need section has been revised in this Final EIS to include the statement that environmental assessment work is being performed by the Ashley National Forest in the Aspbalt Ridge/White Rocks STSA.

34.6 Conversion applies to existing oil and gas leases. These existing leases could be converted to CHLs according to the Combined Hydrocarbon Lease Act of 1981. Potential lease tracts (discussed in Volume III) are those areas where new CHLs would be offered for competitive sale. These terms are defined in the Glossary.

34.7 The pocket map located in the back of Volume I of this Final EIS indicates the land status for National Park and National Forest lands. Volume I, Table 1-1 in this Final EIS lists approximate areas of land administered by other agencies.

34.8 The word "possible" bas been deleted in Volume I under Animal Life in Table 2-4 in this Final EIS.

34.9 "Domestic uses" have been added to Volume I in the list of "uses" in Table 3-5 of this Final EIS.

34.10 The Recreation section of Volume I now includes a discussion of resources and impacts for those portions of the STSA on the Ashley National Forest.

34.11 This data bas been included in Volume I, Chapter 3 of this Final EIS.

34.12 In response to this comment, range conservationists in Vernal, Roosevelt, and Duchesne Ranger Districts bave been contacted. The

Response Letter 34

data in Volume I, Table 3-17 of this Final EIS have been updated to reflect corrections. According to FS range conservationists, no part of the Mill Hollow or White Rocks allotments fall within STSA boundaries. Also, in addition to those allotments mentioned in the comment, portions of Horse Ridge and Farm Creek allotments were found to fall within STSA boundaries.

34.13 The information suggested was stated in the final paragraph of the Recreation section (see Volume I, page 113 of the Draft EIS).

34.14 The Livestock Grazing section in Volume I, Chapter 4 of this Final EIS has been changed in response to this comment.

34.15 The Livestock Grazing section in Volume 1, Chapter 4 of this Final EIS has been changed in response to this comment.

34.16 The Livestock Grazing section in Volume 1, Chapter 4 of this Final EIS has been changed in response to tbis comment.

34.17 The Livestock Grazing section in Volume 1, Chapter 4 of this Final EIS has been changed.

34.18 The Livestock Grazing section in Volume 1, Chapter 4 of this Final EIS bas been changed.

34.19 Volume II contains proposed planning amendments to update BLM's land use plans. These amendments are not intended to affect the FS planning effort or land uses; bowever, related activities could indirectly affect adjacent lands.

34.20 Lease Tract U-26244 is an existing oil and gas lease; therefore, the tract is eligible to be considered for conversion to a CHL and is considered in the alternative levels in Volume I. The potential new lease tracts in Volume III are tracts which are not under existing lease for oil or gas.

34.21 The phrase sbould read "...whicbever is earlier." This error bas been corrected in Volume III of this Final EIS. The intent is that all plans of operations would be received by November 15, 1983.

Comment Letter 35

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295

Ref: 8PM-EA

JAN 30 1984

Roland Robison, State Director
Bureau of Land Management
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

Dear Mr. Robison:

The Region VIII office of the Environmental Protection Agency has completed its review of the Utah Combined Hydrocarbon Leasing Regional Draft Environmental Impact Statement (DEIS). We appreciate the effort that has gone into the process and the difficulties related to the relatively short time frame in which the DEIS documents were produced.

35.1 EPA understands that this DEIS is a decision document developed to meet requirements for the leasing of potential lease tracts under the Combined Hydrocarbon Leasing Act of 1981, Public Law 97-78 and the National Environmental Policy Act (NEPA) Public Law 91-190. We further understand that any development of these leases will be dependent on the approval by BLM of plans of operation submitted by the lessee. Since the implementation of these plans of operation will significantly impact the environment, EPA expects that site specific environmental assessments (EA's) or environmental impact statements (EIS's) related to lease development will be prepared.

35.2 Our primary concerns with the information presented in the three volumes are the lack of discussion related to cumulative impacts of possible tar sand development and interrelated projects such as oil shale development. The analyses of potential air quality impacts for both the low and high production scenarios should discuss impacts on air quality, and potential for acid deposition upon, Class I air sheds in Utah and Colorado. The impacts on

35.3 surface water quality and water quantity requirements are incomplete since inter-impacts from oil shale development are not included. The potential ground water impacts are not considered and apparently the extent of underground sources of drinking water has not been defined. Attached for your consideration in preparation of the final EIS are additional comments.

According to our guidelines we have rated this DEIS as ER-2. This means that we have environmental reservations regarding some aspects of the proposed action. More information and/or some modifications would help alleviate these concerns as our comments indicate. If you have any questions regarding EPA concerns, please contact Mike Hamner of my staff at FTS 327-2351.

Sincerely yours,

Mary H. Nelson for

John G. Welles
Regional Administrator

Attachment

Comment Letter 35

Detailed Comments on the Utah Combined Hydrocarbon Regional Draft EIS

Water Quality/Quantity

35.4 The proposed activities come under the control of four water quality management plans per Section 208 of PL 92-500: Southeastern Utah, Uintah Basin, Five County, and the Statewide 208 Plans. These WQM plans will have a direct impact on selection of Best Management Practices (BMPs) for land-disturbuting activities and associated monitoring requirements. They are enforced on Federal lands through Executive Order No. 12088. The EIS has no discussion of these relationships on implementing mechanisms.

The Southeastern Utah AOG, for one, has been very concerned with protection of municipal water supplies from mining impacts (i.e. Uinta Southwestern Coal Leasing EIS). It has been very involved in the EIS process and there is no reason to believe it would be different for Tar Sands EIS's.

Extensive local control over direct development on Federal lands could evolve out of implementation of Executive Order No. 12372 which is presently being structured as to review procedures. The EIS needs to discuss the issue.

Water rights availability for development could be affected by the recent lawsuit filed by the Sierra Club regarding Federal water rights in Wilderness areas.

35.5 Major concerns regarding flow rates in Desolation and Gray Canyons have not addressed the impacts of such reductions on whitewater rafting recreation which is a significant national recreational resource in the area. The impact on San Rafael whitewater rafting is not evaluated. Green River rafting impacts need to be related to Flaming Gorge water release scenarios during key summer months.

35.6 The legality of Indian tribes setting their own water quality standards for reservation lands is now being established in the court system. How this is decided could have an impact on activities which would impact water flowing on or into this reservation.

35.7 The EIS has no discussion of monitoring to verify adequacy of BMP practices proposed or being implemented. The wide range of precipitation in the area implies significant problems in establishing revegetation on mined lands as well as other land-disturbing activities such as roads. Who will assure adequate BMP maintenance, for how long?

35.8 Water quality impacts should discuss the following potential sources of poor quality water:

Wastewater from production phase
Wastewater from upgrading phase
Dewatering and dust control
Leachate from storage piles (raw and processed materials)

Comment Letter 35

35.8 cont. Runoff from disturbed areas
Wastewater from cooling and/or boiler facilities
Sanitary and sewer system effluents
Mitigation of any adverse impacts should be discussed.

35.9 The EIS should evaluate alternative sources of water. In particular, poor quality water, such as irrigation return flows and other saline water should be considered in lieu of good quality water. This would be consistent with the salinity control policies of the State of Utah and the Colorado River Basin Salinity Control Forum.

35.10 The point/nonpoint source control authorities/responsibilities are not defined.

35.11 The cumulative impacts on water quality and quantity from coal development (Green River-Hams Fork and Uinta-Southwestern Coal regions) in addition to oil shale development and Tar Sands are not discussed.

35.12 Compliance with state water quality standards should be addressed.

35.13 Overall water quality impacts are not addressed adequately for an EIS of this nature.

35.14 What environmentally related assurances/programs/plans will be required by BLM before lease approvals in each STSA, regarding: monitoring, research, and reclamation performance?

35.15 The impacts upon the public water supplies for communities such as Sunnyside, Price, and Helper due to flow depletions and increased salinity and other constituents need to be evaluated both as to treatability and increased cost of treatment.

35.16 Specific known best management practices (BMP's) for erosion control that would be effective in the various areas need to be listed and discussed to provide a basis for an evaluation of the risk involved.

35.17 The NEPA process for each detailed project plan of operation needs to be defined.

35.18 Underground Injection Control Program

We could not find a reference to the Safe Drinking Water Act (SDWA) which authorizes both the Public Water Supply (PWS) and Underground Injection Control (UIC) Programs. These programs have been delegated to the State of Utah; PWS to the Division of Environmental Health; and UIC to the Division of Environmental Health (Class I, III, IV, V) and Division of Oil, Gas and Mining (Class II).

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35.19 The OEIS does not list the Utah Division of Environmental Health as one of the agencies requested to comment. The Division within the scope of authorities and responsibilities of the UIC program, can issue Class V UIC permits for the purpose of assuring protection of underground sources of drinking water from contamination by injection wells used for in-situ recovery of tar sands.

The criteria that would determine whether the Director of the State program would issue a permit on this type of Class V well are contained in 40 CFR 144.12(c) and (d) of the Federal UIC Regulations and Section 7.4.5 of Part VII of the State Regulations. These criteria are structured to prevent violations of primary drinking water regulations as contained in 40 CFR 142 and adverse health effects from injection activities by Class V type wells.

Since the draft EIS states that about 35,000 acres within six of the Special Tar Sand Areas (STSA's) would be developed by in-situ methods and Alternative 1 proposes a 175,000 bbl/day activity level for the in-situ process by the year 2005, it is likely that there will be violations of primary drinking water regulations. In that case, the state would have to exercise its authorities and require the injector to obtain a permit. The permit would set the specific conditions necessary to minimize ground water contamination.

35.20 The technical discussion of the in-situ mining method for recovery of oil from tar sands is weak. As noted in the draft EIS, the in-situ methods for tar sands are similar to those used for tertiary oil recovery. However, the in-situ technology for tar sand is certainly not as well established. Six in-situ recovery methods are mentioned as potentially usable for recovery of oil from tar sands. The discussion only identifies the method and catalogs some of the problems that have occurred in tertiary oil recovery operations. Since this draft EIS seems to indicate that a significant number of the deposits cannot be mined with conventional techniques because the overburden is too thick (Vol. 1, p. 18), it would be appropriate to present a detailed analysis of each possible in-situ technique and the environmental consequences of their use in the various proposed lease areas.

The technical analysis of the in-situ technique should provide information and recommendations on such subjects as well construction, monitoring, the management of in-place residues with regard to leachable substances and their toxicities, and aquifer restoration possibilities.

Since the estimates of the quantities and thicknesses of bitumen are so uncertain and could be off by as much as factors of 10 (Vol. 1, p. 15), the scope of the whole tar sand effort and possible recovery by in-situ mining methods should be scaled down to a very small and easily manageable pilot project with stringent environmental monitoring and controls.

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35.2.1 One of the unresolved issues mentioned on page B of Volume 1 is the use of ground water as a source of water to process tar sands. All of the water sources discussed in the draft are surface water sources (Vol. 1, p. 43). An additional ground water issue that is not addressed is more basic. There has been very little work done to identify existing aquifers in the proposed lease areas. The identification should be made and existing or potential use defined. If in-situ injection activities are being conducted in a formation that contains water that meets the definition of a USDW (i.e. less than 10,000 ppm of TDS) there is a very strong possibility that an application would need to be made to the state to exempt that aquifer under the criteria of the UIC program.

Air Quality

In July of this year John Notar, EPA staff Meteorologist provided technical review comments to the Bureau of Land Management on air quality analyses related to this DEIS. As noted in that review, the lack of site specific data precludes an accurate evaluation of the potential magnitude of air impacts. EPA offers the following additional comments.

The modeling of the high production scenario indicates large scale violations of the National Ambient Air Quality Standards (NAAQS) for particulates (TSP). The Prevention of Significant Deterioration (PSD) increments for TSP or sulfur dioxide (SO_2) will be consumed at 7 of the 9 STSAs. Under the high production scenario it will be impossible to mitigate the TSP problem. Additional control technology can alleviate most of the SO_2 problem but only some of the NO_x problem. This means that there may still be an excess of the SO_2 Class I PSD increment. Presently there is no definitive concentration of NO_x that constitutes acid deposition degradation as there is for SO_2. NO_x emissions are anticipated to be extensive and will be emitted from uncontrollable vehicle exhaust. Acid deposition degradation in downwind Class I areas appears certain.

The analysis of the low production scenario indicates the air quality impacts are significantly less. Only TSP emissions are predicted to exceed the PSD increment and violate the NAAQS. These TSP exceedences will be difficult to mitigate considering the area topography and climate.

While we consider the low production scenario as the least damaging to air quality we feel that serious degradation can occur. It will be quite difficult to protect the NAAQS which are a health-related value from mining and vehicle-generated TSP emissions.

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35.1 The EIS is not a decision document. Rather, it provides a base from which decisions can be made by identifying and analyzing the social, economic, and environmental impacts of the proposed and alternative actions. Site-specific environmental analyses will be prepared on each plan of operations.

35.2 Cumulative maximum criteria air pollutant concentrations are shown in Volume I, Tables 4-3 (high production) and 4-16 (low production) (pages 99 and 146-147, respectively, in the Draft EIS). A detailed listing and discussion of existing and planned major point sources can be found in the BLM-contracted air quality technical report: "Air Quality Analysis for the Combined Hydrocarbon EIS, Eastern and South-Central Utah" (Aerocomp, Inc., 1984). Quantification of regional acid deposition can be found in Volume I, Acid Rain section (page 103 of the Draft EIS). Additionally, the Aerocomp, Inc. (1984) study illustrates the areal distribution of sulfur and nitrogen oxides, the major precursors of acid deposition.

35.3 Water quality impacts in relation to salinity were addressed on a regional level in Volume I, Chapter 4, Alternative 1 (Regional Overview), Water Requirements and Effects on Colorado River System section.

Impacts on water quantity from oil shale development are included in the Bureau of Reclamation's projected water supply and depletions schedule for the upper Colorado River Basin as outlined in Volume I, Appendix 3. These are also referenced in the Uintah Basin Synfuels Development Final Environmental Impact Statement (USDI, BLM, 1983g).

Additional information addressing potential groundwater impacts from introduced contaminants has been included in this Final EIS. See Volume I, Chapter 4, Alternative 1 (Regional Overview), Water Quality (Surface and Groundwater) section, paragraph 4. The extent of underground sources of drinking water has not been defined. However, a summary of groundwater sources, along with a quantity and quality range, is shown in Volume 1, Table 3-6. Also, refer to Letter Response 28.7.

35.4 Refer to Letter Response 29.5. The Southeastern Utah Association of Governments was sent a copy of the Draft EIS and was requested to comment on that document (see Volume I, page iv of the Draft EIS).

35.5 The analysis in Volume I, Chapters 3 and 4, Recreation section, has been expanded to include floatboating on rivers that could be affected by tar sand related water withdrawals.

35.6 It is recognized that a change in position by the Federal government, State, tribes, and/or private claimants could impact water-related activities. Refer to the Disclaimer section at the end of Volume I, Appendix 3 in this Final EIS.

35.7 Where proper, monitoring to ensure the adequacy of post-mining rehabilitation programs would be conducted by an authorized officer of BLM. This monitoring would be conducted in consultation with the appropriate surface management agency. Plans for rehabilitation

would be site-specific and included in an approved plan of operations prior to entry upon the land or disturbance to the surface thereof. See Volume II, Appendix 1, Surface Disturbance Stipulations for Combined Hydrocarbon Leases section.

An authorized officer of BLM, usually a surface protection specialist working for the BLM District Manager of the affected district, would ensure "best management practices" within which a particular STSA is located.

Protection would be ensured as long as necessary. The plan of operations would outline the required rehabilitation, and the District Manager and surface protection specialist would make the final determination of completion of rehabilitation.

35.8 These impacts were addressed collectively in Volume I, Chapter 4, Water Resources section under Alternatives 1 and 2. A more detailed analysis of these impacts would need to be addressed, where appropriate, in a site-specific EA or EIS. Plans of operations submitted by interested companies should address these issues, and appropriate mitigation would be outlined.

35.9 Refer to Letter Response 28.1.

35.10 For a tar sand developer to obtain permission for either a point or nonpoint discharge, the company would be referred to the Utah Water Pollution Control Committee or the EPA.

35.11 The largest percentage of the Green River-Hams Fork Coal Region is on the eastern slope of the Continental Divide and does not drain into the Colorado River drainage area. The smaller portions of the Region and the Uinta-Southwestern Utah Coal Region are in the Colorado River drainage area. Water requirements for these two regions are accounted for in the Bureau of Reclamation's Colorado River Simulation System Model. Volume I, Appendix 3 of this Final EIS contains a list of current and projected water uses.

The cumulative impacts to other expected developments (e.g., coal, oil shale) are accounted for in the depletion schedules in Volume I, Chapter 4 and Appendix 3.

35.12 Additional information regarding State and Federal water quality regulations has been included in this Final EIS. Refer to Volume I, Chapter 4, Alternative 1 (Regional Overview), Water Quality (Surface and Groundwater) section, paragraph 9. Also, refer to Volume II, Appendix 1, Public Water Reserve 107 and Legal Water Source Stipulations section.

35.13 The purpose of this EIS is to analyze impacts resulting from projections of tar sand production. Water quality was summarized and briefly described in the Affected Environment section and expected impacts listed in the Environmental Consequences section. The Colorado River Simulation System model was used to simulate impacts on flows and estimate salinity for the Colorado River and its tributaries resulting from several alternatives of tar sand development. Other potential water quality impacts were also addressed (i.e., sedimentation from surface disturbance, accidental release of leachate waters, residues from processed tar sand, and possible failure of holding ponds).

As proposals are received, more detailed analyses will be performed.

35.14 Different levels of monitoring, research, and reclamation will be required for different types of proposals; much depends on the plan of operations submitted. The requirements for "environmentally related assurances/programs/plans" for tar sand development will vary between STSAs, depending on affected resources and associated impacts, as shown in the EIS. Some of the general requirements are shown in Volume I, Appendix 2 of this Final EIS. Stipulations governing surface disturbance and protecting endangered species, cultural resources, paleontological resources, and wilderness values will be enforced by BLM. Other laws related to air quality, water, and socioeconomic impacts will require monitoring and research by agencies other than BLM.

35.15 The treatment of water is an option that a company would have to consider in its plan of operations for mitigating any loss of water quantity or quality. Whether water would be treatable or would require complete replacement would be one of the considerations in analyzing a plan of operations. Any increased cost of treatment could be considered at this same stage on a site-specific basis. Also, refer to Letter Response 7.1.

35.16 Because of the many differences in the types of soils, topography, geology, erosion hazard, etc., all required erosion control measures were not included in this EIS. Additional data will be included in the site-specific analysis.

Prior to any construction or mining from a tar sand industry, a company must submit a plan of operations which would outline measures to be taken to control erosion. Effectiveness of proposed erosion control methods would be analyzed on a site-specific basis at that time. This would be in response to regulations designated to protect soil, water, and vegetation resources and would be subject to the stipulations as listed in Volume II, Appendix 1, Surface Disturbance Stipulations for Combined Hydrocarbon Leases section.

Also, refer to Volume I, page 105 of the Draft EIS.

35.17 Prior to the initiation of development on any new leases, a plan of operations (as outlined in 43 CFR 3570) will be required. This plan would outline in detail any exploration or production activities on the tract. Where appropriate, environmental review (EA or EIS) would be completed at that time. As modifications to those initial plans of operations are received, the appropriate NEPA documents would be updated.

35.18 Additional information has been included in this Final EIS (Volume I, Chapter 4, Alternative 1 [Regional Overview], Water Quality, Surface and Groundwater section) to address surface and groundwater in relation to State and Federal regulations. Compliance to the Safe Drinking Water Act and other applicable regulations would be required of a tar sand industry. Also, refer to Letter Response 14.60.

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35.19 Refer to Letter Response 14.61.

35.20 The best information on available technology was utilized in the discussion in Volume I, Chapter 2. The discussion for each STSA describes the most likely method of development. In case of in-situ mining, steam injection was used for analysis purposes in Chapter 4.

35.21 Groundwater resources within or near the STSAs were analyzed as possible supply sources and briefly summarized in Volume I, Table 3-6 of the Draft EIS. Also, refer to Table 2-2, which states that the Rocky Mountain Project on the Asphalt Ridge/White Rocks STSA would use groundwater as a source.

Considerable hydrologic information is available for the 11 STSAs (USDI, GS, 1983). However, where analysis of plans of operations indicated that water requirements or injection activities could affect the groundwater resource, additional data on aquifers could be required, particularly where little data are presently available. In-situ injection activities would comply with the State and Federal Underground Injection Control Program.

LIST OF ABBREVIATIONS

Abbreviation	Term
ACEC:	Area of Critical Environmental Concern
ADT:	Average Daily Traffic
APD:	Application for Permit to Drill
API:	American Petroleum Institute
AUM:	animal unit month
bbl:	barrels
BIA:	Bureau of Indian Affairs
BLM:	Bureau of Land Management
Btu:	British thermal unit
CCD:	Census County Division
CFR:	Code of Federal Regulations
CHL:	Combined Hydrocarbon Lease
CMA:	Cooperative Management Area
dBA:	A-weighted sound level
DOE:	Department of Energy
EA:	environmental assessment
EIS:	environmental impact statement
EPA:	Environmental Protection Agency
ERT:	Environmental Research and Technology, Inc.
F:	Farenheit
FIRE:	Finance, Insurance, and Real Estate
FLPMA:	Federal Land Policy and Management Act
FR:	Federal Register
FS:	Forest Service
FWS:	Fish and Wildlife Service
g/cc:	grams per cubic centimeter
g/m^2/yr:	Grams per square meter per year
gpm:	gallons per minute
H_1:	hydrogen
HMP:	Habitat Management Plan
HUD:	Department of Housing and Urban Development
IBLA:	Interior Board of Land Appeals
IMP:	Interim Management Policy
IPP:	Intermountain Power Project
ISA:	Instant Study Area
KGS:	known geologic structure
km:	kilometers
KRCRA:	known recoverable coal resource area
lbs.:	pounds
MFP:	Management Framework Plan
mg/ℓ:	milligrams per liter
mg/m^3:	milligrams per cubic meter
mm:	millimeter
MMS:	Minerals Management Service
mpg:	miles per gallon
mph:	miles per hour
NO_X:	nitrogen oxide
NO_2:	nitrogen dioxide
NPS:	National Park Service
NRA:	National Recreation Area
NWPS:	National Wilderness Preservation System
O_3:	Ozone
OSPC:	Office of the State Planning Coordinator
ORV:	off-road vehicle
PCPI:	per capita personal income
PSD:	Prevention of Significant Deterioration
PRLA:	Preference Right Lease Application
R&PP:	Recreation and Public Purposes
RMA:	Recreation Management Area
RMP:	Resource Management Plan
ROS:	Recreation Opportunity Spectrum
RVD:	Recreation Visitor Day
S:	sulfur
Sec:	section
SERI:	Solar Energy Research Institute
SLM:	Salt Lake Meridian
SMSA:	standard metropolitan statistical area
SO_2:	sulfur dioxide
SSA:	site-specific analysis
SSF:	soil surface factor
STSA:	Special Tar Sand Area
SVIM:	soil-vegetation inventory method
TDS:	total dissolved solids
TSP:	total suspended particulates
UDES:	Utah Department of Employment Security
UDOT:	Utah Department of Transportation
UDWR:	Utah Division of Wildlife Resources
UGMS:	Utah Geological and Mineralogical Survey
ug/m^3:	micrograms per cubic meter
U_3O_8:	uranium oxide
USDA:	United States Department of Agriculture
USDC:	United States Department of Commerce
USDI:	United States Department of Interior
USGS:	United States Geological Survey
V_2O_5:	vanadium oxide
VOC:	volatile organic compounds
VRM:	visual resource management
WA:	Wilderness Area
WDAFS:	Western Division of American Fisheries Society
WSA:	Wilderness Study Area

GLOSSARY

A-WEIGHTED SOUND LEVEL (dBA). The measurement of sound approximating the auditory sensitivity of the human ear.

ACCIPITERS. A genus of small- or medium-sized hawks having short, rounded wings and long tails.

AIR POLLUTION. Accumulation of aerial wastes beyond the concentrations that the atmosphere can absorb and, in turn, which may damage the environment.

ALLOTMENT (RANGE ALLOTMENT). A management area designated for the use of a prescribed number and kind of livestock under one management plan. An area where one or more livestock permittees graze their livestock, consisting of public lands and any enclosed State and private lands.

ALLUVIAL FANS. Unconsolidated sedimentary material deposited by streams in fan- or cone-shaped deposits at the base of mountains.

ALTERNATIVE. One of at least two proposed means of accomplishing planning objectives.

AMBIENT AIR QUALITY. Prevailing condition of the atmosphere at a given time; the outside air. All lands are categorized in one of the Prevention of Significant Deterioration (PSD) classes. Class I is the most restrictive and generally applies to specific national parks and monuments. No decrease in air quality is allowed under this class. Class II areas allow some decrease in air quality. Class III areas allow for a substantial decrease in air quality such as is found in urban areas.

ANALYSIS. The examination of existing and/or recommended management needs and their relationships to discover and determine the outputs, benefits, effects, and consequences of initiating a proposed action.

ANIMAL UNIT MONTH (AUM). The amount of forage required to sustain the equivalent of 1 cow or 6.2 sheep for 1 month; 5.8 deer for 1 month; 9.6 antelope for 1 month; 5.5 bighorn sheep for 1 month; or 2.2 burros for one month (usually 800 lbs. of useable air-dried forage).

ANTICLINE. An upfold or arch of stratified rock in which the beds or layers bend downward in opposite directions from the crest or axis of the fold.

AQUATIC. Living or growing in or on the water.

AQUIFER. A geologic formation or structure that transmits water. Aquifers are usually saturated sands, gravel, fractured rock, or cavernous rock.

ARCHAEOLOGY. The scientific study of past cultures.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC). An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes, or to protect life/provide safety from natural hazards.

AVERAGE DAILY TRAFFIC (ADT). The total number of vehicles traveling both directions on a section of road during a time period divided by the number of days in that time period.

AVULSION. A sudden change in the course of a river.

BASIC VISUAL ELEMENTS. See Visual Elements.

BITUMEN. A naturally occurring viscous mixture of hydrocarbons that may contain sulphur compounds and that, in its' naturally occurring state, is not recoverable at a commercial rate through a well.

BRITISH THERMAL UNIT (Btu). The quantity of heat required to raise the temperature of one avoirdupois pound of water 1 degree Farenheit at or near 39.2 F.

CARBON MONOXIDE. A colorless, odorless, toxic gas that competes with oxygen for bonding sites on the hemoglobin molecule in the blood.

CARRYING CAPACITY. The maximum stocking rate of livestock and/or big game possible without damaging vegetation or related resources. It may vary from year to year on some areas because of fluctuating forage production.

CATEGORIES (LEASING). The four categories used to determine leasing activities for oil and gas and tar sand were based on potential for development, other resource uses, and protection of sensitive resource values. *Category 1* opens all public lands to leasing with standard stipulations. *Category 2* allows leasing with standard and special stipulations to protect sensitive resource values. *Category 3* allows leasing with no right of surface occupancy; recovery methods must not disturb the surface; and *Category 4* closes lands to leasing.

CENSUS COUNTY DIVISION (CCD). A division designated to represent community areas focused on trading centers or to represent major land use areas. (CCDs have visible, permanent, and easily described boundaries.)

CENTIPOISE. A unit of viscosity equal to 1/100 poise. (A poise is a cgs absolute unit of viscosity that is equal to one dyne-second per square centimeter.)

CHANGE AGENT. Any factor (person, physical force, living entity, chemical, etc.) which affects the primary characteristics of an ecological element, either positively or negatively.

CLEAN AIR ACT (42 USC 1857 et seq.). An act for air pollution prevention and control: (1) to protect and enhance public health and welfare and the productive capacity of its population; (2) to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; (3) to provide technical and financial assistance to state and local governments in connection with the development and execution of their air pollution prevention and control programs; (4) to encourage and assist the development and operation of regional air pollution control programs.

COMBINED HYDROCARBON LEASE (CHL). A lease issued in a Special Tar Sand Area (STSA) which entitles the lessee to remove any gas and nongaseous hydrocarbon substance other than coal, oil shale, or gilsonite.

COMPLETE HYDROLOGICAL TESTING. As used in this EIS, it is in reference to maintaining the water balance in the affected area. A hydrologic inventory to determine the water balance would be completed to detect any losses in either quantity or quality so that mitigation could occur. The hydrogeologic evaluation would be of an extent capable of predicting whether or not mining activities would interrupt the flow of springs or reduce the base flow of perennial streams.

CONVERSION LEASE TRACT. As used in this EIS, changing an oil and gas lease existing before November 16, 1981 to a Combined Hydrocarbon Lease (CHL). A CHL allows production of all hydrocarbons except coal, oil shale, and gilsonite.

CRUCIAL WILDLIFE HABITAT. That portion of wildlife habitat essential to the survival and perpetuation of a certain species in an area.

CRUDE OIL. Oil as it comes from a well.

CULTURAL RESOURCES. Those resources of historical or archaeological significance.

DECANT SYSTEM. A system for separating water from solid waste material.

DEPOSIT. An accumulation of a mineral.

DIRECTIONAL DRILLING. Slant drilling or drilling on an angle. Directional drilling is utilized when the operator is not allowed to occupy the surface of a given tract of land, but still wishes to drill a structure or target beneath that tract.

EDGE EFFECT. The effect that occurs when two or more habitat types come together and create more favorable wildlife habitat than either type could provide alone.

ERODIBILITY. Susceptibility of a soil to erosion by water or wind. Relative terms are none, slight, moderate, and high.

ENDANGERED SPECIES. Any animal or plant species in danger of extinction throughout all or a significant portion of its range.

ENVIRONMENTAL ANALYSIS. A systematic process for consideration of environmental factors in land management actions.

EXPLORATION PERMIT. A prospecting permit; a short-term agreement granting the holder the right to explore for minerals, oil and gas, or tar sand.

EXPRESSIONS OF INTEREST. As used in this EIS, industry nominations to lease tracts within Special Tar Sand Areas (STSAs) which are not currently under lease.

EXTRACTION. As used in this EIS, the process by which bitumen is separated from sand, water, and other impurities.

FLOODPLAIN. Nearly level land bordering a stream; this land consists of stream sediments and is subject to flooding.

FORAGE. Vegetation of all forms available and of a type used for animal consumption.

FORB. A broad leafed herb.

HABITAT. A specific set of physical conditions that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

HERD UNIT. An area designated by the Utah Division of Wildlife Resources (UDWR) as a big game (i.e.,deer, elk, moose, etc.) herd management area.

HOMOGENEOUS. In this EIS, of uniform structure or composition throughout.

HYDROCARBONS. Organic chemical compounds of hydrogen and carbon atoms which form the basis of all petroleum products.

HYDROPHILIC. Having an affinity for water.

INFRASTRUCTURE. The set of supporting systems and facilities (i.e., transportation, education, medical service, communication, fire, and police protection, etc.) that support a region's or community's social and economic structures.

IN PLACE. As used in this EIS, the gross volume of crude bitumen or oil calculated or interpreted to exist in a reservoir before any volume has been produced.

IN SITU. In place; in the original location.

IN-SITU EXTRACTION. As used in this EIS, extracting the oil from tar sand while it is still in place by injecting steam, solvents, and/or heat.

INTERIM MANAGEMENT POLICY (IMP). An interim measure governing uses on lands under wilderness review. This policy protects Wilderness Study Areas (WSAs) from impairment of their suitability for designation as wilderness.

INTERMITTENT STREAM. A stream which flows part of the time, usually after a rainstorm or during a spring thaw.

ISOPLETH. A line connecting points at which a given variable has a constant value.

KNOWN GEOLOGIC STRUCTURE (KGS). A geologic structure known to be present containing a producing or producible oil or gas well.

LAND USE PLAN. A planning decision document which establishes resource allocations and coordinated objectives and constraints for all forms of public land and resource uses within a specified area.

LEASE (MINERAL). A contract between a landowner and another granting the latter the right to search for and produce gas, hydrocarbons, or other mineral substances upon payment of an agreed-upon rental, bonus, and/or royalty.

LEASE CONVERSION. As used in this EIS, the process of converting an existing oil and gas lease in a Special Tar Sand Area (STSA) to a Combined Hydrocarbon Lease (CHL). The conversion is completed through approval of a plan of operation outlining how the hydrocarbon resource will be developed.

LEASING CATEGORIES. Refer to categories (leasing).

LENTICULAR. Having the shape of a double-convex lens.

LEVEL OF SERVICE. A maximum number of vehicles that can pass over a given section of roadway during a specified time period. This is a qualitative measure of the effect of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, and convenience, and operating costs.

LINEAR SOURCE. A line or trajectory at which material or other matter is added to a system either instantaneously or continuously. An example of a linear source in the context of air pollution would be highway traffic.

LIQUID HYDROCARBONS. Oil substances other than gas and solid substances (i.e., coal, oil shale, and gilsonite) which occur naturally in the earth.

LOGICAL PRODUCTION AREA. An area of land in which the recoverable mineral reserve can be developed in an efficient, economical, and orderly manner as a unit with due regard to conservation of other resources.

MANAGEMENT FRAMEWORK PLAN (MFP). A land use plan for public lands administered by BLM which provides a set of goals, objectives, and constraints for a specific planning unit or area; a guide to the development of detailed plans for the management of each resource.

MEAN VISUAL RANGE. The average distance of how far any object can be seen by the human eye.

MIGRATION ROUTES. Historical wildlife routes used to travel from one type of seasonal range to another.

MILLIDARCY. A unit of porous permeability equal to 1/1000 darcy. Having to do with flow of fluids under pressure. A darcy is a unit of measure where the rate of flow of a fluid having one centipoise viscosity under pressure gradient of one atmosphere per centimeter would be 1 cubic centimeter per second per square centimeter cross section.

MITIGATION MEASURES. Measures developed to lessen impacts to resources resulting from proposed projects.

MONOCLINE. A geologic structure in which the strata are all inclined in the same direction at a uniform angle of dip.

MULTIPLE USE. Management of public lands and their various resource values so that they are used in the combination best meeting the present and future needs of the American people. Relative resource values are considered, not necessarily the combination of uses that will give the greatest potential economic return or the greatest unit output.

NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS). National standards, established under the Clean Air Act by the Environmental Protection Agency, prescribing levels of pollution in the outdoor air which may not be exceeded. *PRIMARY NAAQS*: Standard set at a level to protect public health from damage from air pollution. *SECONDARY NAAQS*: Standard set at a level to protect public welfare from damage from air pollution.

NATIONAL WILDERNESS PRESERVATION SYSTEM (NWPS). A system composed of Federally owned areas designated by Congress as Wilderness Areas. These areas shall be administered for the use and enjoyment of the American people; management actions will preserve wilderness values for future use and enjoyment.

NITROGEN OXIDES (NOx): Compounds produced by combustion, particularly when there is a excess of air or when combustion temperatures are very high. Nitrogen oxides are primary air pollutants.

NONIMPAIRMENT CRITERIA. A series of guidelines which govern surface-disturbing activities on lands being studied by BLM for inclusion in the National Wilderness Preservation System (NWPS). The guidelines require that lands be managed so as to not impair their

suitability for designation as wilderness and so that any reclamation of disturbed areas be substantially unnoticeable by the time the Secretary of Interior makes his recommendation on Wilderness Areas to the President.

NOTICE OF INTENT. A notice submitted to BLM by an existing oil and gas lessee in a Special Tar Sand Area (STSA). This notice states that the lessee intends to submit a plan of operation to convert his existing lease to a Combined Hydrocarbon Lease (CHL).

NO ACTION ALTERNATIVE. An alternative which would continue the current management direction or level of management intensity.

NODE. As used in this EIS, the actual measuring point for the Colorado River simulation system which determines flow and salinity.

OFF-ROAD VEHICLE (ORV). Any motorized vehicle designed for or capable of cross-country travel over land, water, sand, snow, ice, marsh, swampland, or other terrain.

OIL. All nongaseous hydrocarbon substances other than those substances leasable as coal, oil shale, or gilsonite (including all vein-type solid hydrocarbons).

OUTCROPS (TAR SAND). Those parts of a tar sand deposit exposed at the surface.

OVERBURDEN. Material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal, especially those deposits mined from the surface by open cuts.

OZONE. A colorless to bluish gas produced by photochemical reactions with hydrocarbons and oxides of nitrogen.

PARTICULATE MATTER. Any material, except water, in a chemically uncombined form that is or has been airborne and exists as a liquid or a solid at standard temperature and pressure conditions. Minute particles of coal dust, fly ash, and oxides temporarily suspended in the atmosphere.

PATENTED MINING CLAIM. A parcel of mineral land for which the Federal Government has conveyed title to an individual.

PERCHED WATER TABLE. An aquifer formed by beds of clay or silt, unfractured consolidated rock, or other material with a relatively lower permeability than the surrounding materials, present in some areas above the regional water table. It is of limited areal extent with an unsaturated zone between bottom of the perching bed and the regional water table.

PERENNIAL STREAM. A stream with a yearlong flow.

PERMEABILITY (SOIL). The ease with which gasses, liquids, or plant roots penetrate or pass through a layer of soil.

PETROGLYPH. Prehistoric rock art pecked or carved into rock.

PICTOGRAPH. Prehistoric rock art drawn or painted onto rock.

PILOT PLANT. A small plant for testing chemical processes under actual production conditions.

PLAN OF OPERATIONS. As used in this EIS, a plan submitted by a lessee which outlines in detail exploration and mining proposals.

PLANNING AREA. One or more planning units for which Management Framework Plans (MFPs) or Resource Management Plans (RMPs) are revised/prepared.

PLANNING UNIT. A geographic unit within a BLM district which includes related lands, resources, and use pressure problems; these items are all considered for resource inventory and planning.

POINT SOURCE. A point at which matter is added to a system either instantaneously or continuously. An example of a point source in the context of air pollution would be a smokestack.

POTENTIAL LEASE TRACT. Areas within Special Tar Sand Areas (STSAs) not already leased for oil and gas, and which may be considered for new competitive leasing.

PRECURSOR: In this EIS, a substance from which another substance is formed, especially by natural processes.

PRIMITIVE RECREATION. Nonmotorized and undeveloped types of outdoor recreational activities.

PRIMITIVE RECREATION VALUES. Environmental features that enhance the quality of unconfined, undeveloped, and unmotorized recreation (i.e, hiking, backpacking, horseback riding, cross-country skiing, etc.). A general description would be scenic, undeveloped lands essentially removed from the effects of civilization with opportunities for solitude.

PRIOR STABLE LEVEL. This number is derived from consideration of deer population dynamics data averaging 10 or more years when deer populations were stable. This level is at the range's carrying capacity for a given deer herd unit.

PUBLIC LANDS. Any lands or interest in lands outside of Alaska owned by the United States and administered by the Secretary of Interior through the BLM, except lands located on the Outer Continental Shelf and lands held for the benefit of Indians.

PUBLIC PARTICIPATION. The process of attaining citizen input into each stage of the planning process. It is required as a major input into BLM's planning system.

QUAD. One quadrillion British thermal units (Btus) of energy.

RAIN SHADOW. A region of reduced rainfall to the lee of high mountains.

RAPTORS. Birds of prey such as eagles, hawks, and owls.

RECLAMATION. The process of converting mined land to its former or other productive uses.

RECREATION AND RESOURCE UTILIZATION (RRU) ZONE. A land use planning zone within lands administered by the National Park Service (NPS) which allows mineral development and livestock grazing to the extent these uses are compatible with recreation.

RESOURCE. A product of the earth or biosphere capable of serving, supplying, or supporting some human purpose or need.

RESOURCE AREA. A manageable geographic subdivision of a BLM district consisting of one or more planning units or areas.

RESOURCE MANAGEMENT PLAN (RMP). A written land use plan that outlines BLM's decisions and strategy for management of the resources in a particular area. The RMP is replacing Management Framework Plans (MFPs) in BLM's planning system.

RIPARIAN HABITAT. A native environment which supports plants adapted to moist growing conditions. Such habitat is found along waterways, ponds, and other wet areas.

RIVER MORPHOLOGY. The structure and form of the river.

RURAL LIFESTYLE VALUES. Those lifestyle values of significant worth as perceived by residents or local communities in a rural social environment.

SAGE GROUSE STRUTTING GROUNDS. A communal courtship display ground where both sexes of sage grouse congregate during the breeding season to mate.

SATURATION. As used in this EIS, a measure of the extent to which pore space in the sand or rock is occupied by bitumen or oil. Also, the extent to which pore space in soil is occupied by water.

SCENIC QUALITY. The visual aesthetics of an area, based on the visual elements of landforms, vegetation, color, water, adjacent scenery, and amount of cultural modification. It indicates the visual quality of an area relative to other scenery in the region. BLM ratings are A (exceptional/extraordinary); B (high); and C (low/common).

SCOPING PROCESS. A process whereby public issues and concerns for a proposed project are identified.

SEDIMENT YIELD. The average amount of sediment (mineral or organic soil material) from a square mile transported by water from source areas into local water courses. Sediment yield represents an average over a long period, such as 25 years or more (USDI, Bureau of Reclamation, 1975).

SEMI-PRIMITIVE MOTORIZED RECREATION. A roaded area (primitive and secondary county maintained) of at least 2,500 acres, which is largely natural with surface disturbances limited. Only small, isolated structures and evidences of man are present, and encounters between users are moderate. Off-site administration of users is encouraged with small on-site controls evident.

SENSITIVE SPECIES. Species not yet officially listed but undergoing status review for listing on the official Fish and Wildlife Service (FWS) Threatened and Endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

SERAL COMMUNITIES. Communities depicting various stages of plant development.

SHRUB. A plant that has a persistent woody stem, a relatively low growth habit, and generally produces several basal shoots instead of a single trunk.

SPECIAL TAR SAND AREA (STSA). An area designated by the Department of Interior's Orders of November 20, 1980 (45 Federal Register 76800) and January 21, 1981 (46 Federal Register 6077), and referred to in those orders as Designated Tar Sand Areas, as containing substantial deposits for tar and sand. Eleven STSAs are recognized in Utah by the Combined Hydrocarbon Leasing Act of 1981. The Act provided for the conversion of existing oil and gas leases in STSAs to Combined Hydrocarbon Leases (CHLs). This Act also requires competitive leasing for currently unleased lands within STSAs.

SOIL-VEGETATION INVENTORY METHOD (SVIM). A uniform, systematic method for inventory of soil and vegetation resources and data collection for use in planning and environmental assessments.

STAGING GROUND. A gathering and starting point for a recreational activity.

STATE LANDS. Lands owned by the State of Utah: school lands, sovereign lands, and lands acquired for special purposes.

SULFUR OXIDES. Combustion of fossil fuels that may yield a pungent toxic gas.

TAR SAND. Any consolidated or unconsolidated rock (other than coal, oil shale, or gilsonite) that either: (1) contains a hydrocarbonaceous material with a gas-free viscosity at original reservoir temperature greater than 10,000 centipoise; or (2) contains a hydrocarbonaceous material and is produced by mining or quarrying. Tar sand constitutes one of the largest known nonfluid petroleum resources in the United States. Approximately 90 percent of the United States' tar sand (27 billion barrels) is located in Utah.

TAR SAND DEPOSIT. A natural bitumen (oil-impregnated) containing or appearing to contain an accumulation of tar sand, separated or appearing to be separated from any other such accumulation.

THREATENED SPECIES. Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range.

TIERING. Tiering of Environmental Impact Statements (EISs) refers to the process of addressing a broad, general program, policy, or proposal in an EIS and analyzing a narrower site-specific proposal related to the initial program.

UNIT RESOURCE ANALYSIS (URA). A compilation of physical resource data and an analysis of the current use, production, condition, and trend of resources; the URA also contains a profile of ecological values and describes potentials and opportunities for development of resources within a planning unit or area.

VISCOUS: Having a thick consistency and lacking easy movement or fluidity.

VISIBILITY. The greatest distance in a given direction of which it is possible to see and identify with the unaided eye a prominent dark object against the sky at the horizon.

VISUAL DISTANCE ZONE. The expression of the normal distance of viewers from an area being viewed: foreground/middle ground--up to 5 miles; background--up to 15 miles; and seldom seen--greater than 15 miles or areas screened from normal view points.

VISUAL ELEMENTS (BASIC). The elements which determine how the character of a landscape is perceived. *Form*: the shape of objects such as landforms or patterns in the landscape. *Line*: Perceivable linear changes in contrast resulting from abrupt differences in form, color, and texture. *Color*: The reflected light of different wave lengths that enables the eye to differentiate otherwise identical objects. *Texture*: The visual result of variation in the surface of an object.

VISUAL RESOURCE MANAGEMENT (VRM) SYSTEM. Classification containing specific objectives for maintaining or enhancing visual resources, including the kinds of structures and modifications acceptable to meet established visual goals.

VISUAL SENSITIVITY. An expression of the average number of people that view an area and the relative degree (high, medium, or low) of concern they have regarding potential or proposed modification of the landscape in that area.

VOLATILE ORGANIC COMPOUNDS (VOC). Hydrocarbon emissions that react in the presence of sunlight to produce ozone.

WATERFOWL. Wildlife species such as ducks, geese, and swans.

WATERSHED. The total area above a given point on a stream that contributes water to the flow at that point.

WETLANDS. Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds.

WILDERNESS. An area were the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements.

WILDERNESS AREA. An area officially designated as wilderness by Congress. Wilderness Areas will be managed to preserve wilderness characteristics and shall be devoted to the public purposes of conservation and recreational, scenic, scientific, educational, and historical uses.

WILDERNESS MANAGEMENT POLICY. The BLM policy which governs administration of public lands designated as Wilderness Areas by Congress. It is based on the mandate of Congress as contained in the Wilderness Act of 1964 and the Federal Land Policy and Management Act (FLPMA) of 1976. FLPMA requires a Wilderness Area to be a roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) of the Wilderness Act.

WILDERNESS STUDY AREA (WSA). An area under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System (NWPS).

ZERO DISCHARGE. The lack of any effluvent from a given point or source.

BIBLIOGRAPHY

Aerocomp, Inc. 1983. "Air Quality Analysis for the Combined Hydrocarbon EIS, Eastern and South-Central Utah" (unpublished document). Volumes I and II. Costa Mesa, California.

Aerocomp, Inc. 1983b. "Sunnyside Combined Hydrocarbon Lease Conversion Air Quality Technical Report" (unpublished document). November 1983. Costa Mesa, California.

Aerocomp, Inc. 1984. *Final Air Quality Analysis for the Combined Hydrocarbon EIS, Eastern and South-Central Utah. Parts I and II.* June 1984. Costa Mesa, California.

Allen, Rich. 1983. "Data for 1984 Grazing Fee Determination" (personal communication). August 2, 1983. U.S. Department of Agriculture. Washington, D.C.

American Institute of Architects Research Corporation. 1979. *Life-Cycle Cost Study of Commercial Buildings.* December 1979. Washington, D.C.

Argonne National Laboratories. 1983. "Draft Socioeconomic Technical Report: Regional Analysis of Tar Sand Development in Utah" (unpublished document). July 1983. Argonne, Illinois.

Blakey, R. C. et al. 1977. "Petroliferous Lithosomes in the Moenkopi Formation, Southern Utah." Volume IV, No. 2. Utah Geological and Mineralogical Survey. Salt Lake City, Utah. pp. 67-84.

Burnett, Keith J. 1976. *Overall Economic Development Program—1976.* Southeast Utah Economic Development District, Price Utah. 36 pp.

Burns and McDonald. 1979. "The Environmental Analysis Report for the Moon Lake Project" (unpublished document). Volume I. December 31, 1979. Kansas City, Missouri.

Burt, E. W. 1977. *Valley Model User's Guide.* Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.

Campbell, J. A. and Ritzma, H. A. 1979. *Geology and Petroleum Resources of the Major Oil-Impregnated Sandstones of Utah.* August 1979. Utah Geological and Mineral Survey, Salt Lake City, Utah. 19 pp.

Carter, Paul. 1983. "Tar Sand Extraction Within Circle Cliffs" (personal communication). June 1983. U.S. Department of the Interior, Bureau of Land Management, Cedar City, Utah.

Clark, W. and Page, J. 1981. *Energy, Vulnerability, and War.* W. W. Norton, New York, New York.

Colorado State University. 1971. *Water Pollution Potential of Spent Oil Shale Residues.* Environmental Protection Agency, Water Quality Office, Water Pollution Control Research Series 14030 No. DB. 101 pp.

Cook, Earl F. 1976. *Man, Energy, Society.* W. H. Freeman, San Francisco, California.

Cortese, Charles F. and Jones, Bernie. 1977. "The Sociological Analysis of Boom Towns in Contributions to Environmental Sociology." *Western Sociological Review.* Volume 8, No. 1. Utah State University, Department of Sociology, Social Work, and Anthropology. Logan, Utah. pp. 76-90.

Council on Environmental Quality. 1980. "Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory" (personal communication). August 10, 1980. Washington, D.C. 8 pp.

Council on Environmental Quality. 1983. "Proposed Guidance Memorandum for Federal Agency NEPA Liasons." *Federal Register* Notice. August 11, 1983. U.S. Government Printing Office, Washington, D.C.

Cronquist et al. 1972. *Intermountain Flora.* Volume 1. Hafner Publishing Company. New York, New York. 103 pp.

Dalton, Larry. 1983. "Mule Deer Population on Herd Unit 27B" (personal communication). August 31, 1983. Utah Division of Wildlife Resources, Price, Utah.

Davidson, E. S. 1967. *Geology of the Circle Cliffs Area, Garfield and Kane Counties, Utah.* Bulletin 1229. U.S. Department of the Interior, Geological Survey. Washington, D.C. 140 pp.

Duncan, Dawn H. 1983. "Ute Attitudes Regarding Energy Development in the Uinta Basin" (unpublished document). April 1983. Ute Indian Uintah and Ouray Indian Reservation, Utah.

Earth Environmental Consultants, Inc. 1980. "Soil-Vegetation Inventory Method (SVIM) in the Henry Mountain Planning Unit, Utah" (unpublished document). Volumes 1 and 2. May 1980. U.S. Department of the Interior, Bureau of Land Management, Richfield District, Richfield, Utah.

Electric Power Research Institute. 1983. "Acid Rain Research, A Special Report" (unpublished document). Volume 8, No. 9. November 1983. EPRI Journal, Palo Alto, California.

Enercor. 1982. "An Application and Development Plan for the Conversion of Federal Oil and Gas Leases to Combined Hydrocarbon Leases" (unpublished document). November 24, 1982. Salt Lake City, Utah. 199 pp.

Environmental Protection Agency. 1971. "Transportation Noise and Noise From Equipment Powered by Internal Combustion Engines" (unpublished document). December 1971. Office of Noise Abatement Control. Washington, D.C. p. 95.

Environmental Protection Agency. 1977. "Acid Rain, Research Summary" (unpublished document). October 1977. Office of Research and Development, Washington, D.C. pp. 2-7.

Fawcett, G. Allen. 1979. "Six-County Development Plans" (unpublished document). September 1979. Four Corners Regional Commission, Richfield, Utah.

Federal Energy Administration. 1980. "Industrial Cogeneration—What It Is, How It Works, Its Potential." Report EMD-80-7. April 29, 1980. U.S. General Accounting Office. Washington, D.C.

Gallizioli, Steve. 1977. "Overgrazing on Desert Bighorn Ranges." *Transactions of the Desert Bighorn Council.* pp. 21-23.

Gardner, Dan. 1983. "Wild Horses or Burros on P. R. Spring and Hill Creek STSAs" (personal communication). August 22, 1983. U.S. Department of the Interior, Bureau of Land Management, Vernal District. Vernal, Utah.

Gray, Charles, and Von Hippel. 1981. "The Fuel Economy of Light Vehicles." *Scientific American.* Volume 244, No. 5. May 1981. pp. 49-59.

Hand, Forrest E., Jr. 1979. "Grand Water Resources in the Northern Part of the Glen Canyon National Recreation Area and Adjacent Lands West of the Colorado And Green Rivers, Utah" (Maps and Illustrations). University of Wyoming, Water Resources Institute. p. 40.

Hayes, Denis. 1976. *Energy: The Case for Conservation.* January 1976. Worldwatch Institute, Washington, D.C.

Herbeck, E. F.; Heintze, R. C.; and Hastings, J. R. 1977. "Fundamentals of Tertiary Oil Recovery." *Petroleum Engineer.* February 1977. University of Utah, Salt Lake City, Utah.

BIBLIOGRAPHY

Holmes, C. M.; Page, B. M.; and Averitt, Paul. 1948. *Geology of the Bituminous Sandstone Deposits Near Sunnyside, Carbon County, Utah, Preliminary Map 86.* U.S. Department of the Interior, Geological Survey, Oil and Gas Investigations Division. Washington, D.C.

Hood, J. W. 1977. *Hydrologic Evaluation of Ashley Valley, Northern Uinta Basin Area, Utah.* Utah Department of Natural Resources Technical Publication 54. 25 pp.

Hornback, Ken. 1984. "Impacts of Tar Sand Development Related Population Increases on Visitation in National Park Service Lands" (personal communication). April 12, 1984. U. S. Department of the Interior, National Park Service. Denver, Colorado.

Hubbard, Harold. 1983. "Estimates of Recoverable and Unrecoverable Tar Sand Resources" (unpublished document). August 1983. U.S. Department of the Interior, Bureau of Land Management. Richfield, Utah.

Hubbard, Harold. 1984. "Relationship of Locations of Tar Sand Deposits and Groundwater in the Pariette STSA" (personal communication). February 1984. U.S. Department of the Interior, Bureau of Land Management. Vernal, Utah.

Hubbard, John P. 1977. "Importance of Riparian Ecosystems: Biotic Considerations" (unpublished document). U.S. Department of Agriculture, Rocky Mountain Forest and Range Experiment Station. Fort Collins, Colorado. pp. 14-18.

Hunter G. N. and Yeager, L. E. 1969. "Management of the Mule Deer." *The Deer of North America.* The Stackpole Company, Harrisburg, Pennsylvania. pp. 449-482.

Julander, O.; Robinette, W. L.; and Jones, D. A. 1961. "Relation of Summer Range Condition to Mule Deer Herd Productivity." *Journal of Wildlife Management.* Vol. 25 (1). Allen Press Publications, Lawrence, Kansas. pp. 54-60.

Koehler, David A. and Redente, Edward F. 1980. "Revegetation Techniques on Disturbed Lands Associated With Oil Shale Development." Thirty-Second Annual Meeting of the Society for Range Management. p. 44.

Konwinski, Gary. 1983. "Utah Special Tar Sand Areas, Their Water Requirements and the Future Effect on the Colorado River System" (unpublished document). June 1983. U.S. Department of the Interior, Bureau of Land Management, Denver Service Center. Denver, Colorado.

Kuchler as cited by Cronquist, et al. 1972. *Intermountain Flora.* Volume 1. Hafner Publishing Company. New York and London. p. 103.

Laing, Gary. 1983. "Discussion on Number of Acres of Crucial Deer Summer Range on the Asphalt Ridge/White Rocks STSA" (personal communication). September 1983. U.S. Department of Agriculture, Forest Service, Vernal Ranger District, Vernal, Utah.

Latil, M.; Barobu, C.; Burger, J.; and Sourieau, P. 1980. *Enhanced Oil Recovery.* Gulf Publishing Company, Houston, Texas. pp. 178-204.

Lawrence Livermore National Laboratory. 1981. *Energy Requirements From Technology Assessment: Environmental Health and Safety Impacts Associated With Oil Recovery from U.S. Tar Sand Deposits.* October 13, 1981.

Lovins, Amory B., and Lovins, L. H. 1982. *Brittle Power: Energy Strategy for National Security.* Brick House, Andover, Massachusetts.

Marchant, L. C. 1984. "Tar Sand Recovery Methods" (personal communication). March 9, 1984. Laramie Energy Technology Center, Laramie, Wyoming.

McKell, Cyrus M., et al. 1978. *Rehabilitation Potential for Henry Mountain Coal Field.* U.S. Department of the Interior, Bureau of Land Management. Utah State University, Logan, Utah. p. 12.

Miller, J. F.; Frederick, R. H.; and Tracey, R. J. 1973. *Precipitation Frequency Atlas of the Western United States.* Volume VI-Utah. National Oceanic and Atmospheric Administration NOAA Atlas 2. Washington, D.C.

Molenaas, Cornelius M. and Sandberg, Charles A. 1982. "Petroleum Potential of Wilderness Lands in Utah." *Petroleum Potential of Wilderness Lands in the Western United States.* U.S. Geological Survey. Government Printing Office, Washington, D.C. pp. k-1-k-11.

Mono Power Company. 1983. "Mono Power Company Plan of Operations" (unpublished document). April 19, 1983. Rosemead, California.

Moran, Joseph M.; Morgan, Michael D.; Wiersma, James H. 1973. *An Introduction to Environmental Sciences.* Little, Brown and Company, Boston, Massachusetts.

Mundorff, J. R. 1979. *Reconnaissance of Chemical Quality of Surface Water and Fluvial Sediment in the Dirty Devil River Basin, Utah.* Utah Department of Natural Resources Technical Publication 65. Salt Lake City, Utah. 132 pp.

Murie, O. J. 1966. *The Elk of North America.* The Stackpole Company, Harrisburg, Pennsylvania. 376 pp.

Nellis, Lee and Nicholson, John. "County and Community Infrastructure" (unpublished document). June 1983. Utah State University Foundation, Logan, Utah.

Nelson, Brian. 1984. "Effluent Limitations for a Tar Sand Upgrading Facility" (personal communication). April 16, 1984. State of Utah, Department of Health, Bureau of Water Pollution Control. Salt Lake City, Utah.

Ninety-Seventh Congress. 1981. "Combined Hydrocarbon Leasing Act." *Federal Register* Notice. January 5, 1981. U.S. Congress, Washington, D.C. 3 pp.

Office of Surface Mining. 1983. "Regulations for Surface Coal Mining (30 CFR 816)" *Federal Register* Notice. September 2, 1983. U.S. Government Printing Office. Washington, D.C. p. 40160.

Oppenheimer, M. 1982. "The PSD Increments and NAAQS for SO_2 Do Not Protect Against Acidification of Sensitive Environments: Colorado Needs an Acid Deposition Standard" (unpublished document). Environmental Defense Fund. New York, New York.

Pederson, J. C. and Harpe, K. T. 1978. "Factors Influencing Productivity of Two Mule Deer Herds in Utah." *Journal of Range Management.* Volume 31. Society for Range Management, Denver, Colorado. pp. 105-111.

Ritzma, H. R. 1979. *Oil-Impregnated Rock Deposits of Utah (Map 45).* Utah Geological and Mineral Survey. Salt Lake City, Utah. 2 pp.

Ritzma, H. R. 1984. "The Origin of Tar Sand Deposits" (personal communication). March 29, 1984. Salt Lake City, Utah.

Ryder, R. T.; Fouche, T. D.; and Eliason, J. H. 1976. *Early Tertiary Sedimentation in the Western Uinta Basin, Utah.* Volume 87. Geological Society of America. Boulder, Colorado. pp. 496-512.

Seiler, R. A. and Tooley, J. E. 1982. *Erosion and Sediment Characteristics of the Southeastern Uinta Basin, Utah and Colorado.* U.S. Geological Survey—Water Resources Investigations 82-428. 44 pp.

Skinner, Quentin. 1980. "Environmental Survey—Tar Sands In-situ Processing Research Program (Vernal, Uintah County, Utah)" (unpublished document). March 1980. U.S. Department of Energy, Technical Information Center. Laramie, Wyoming. pp. 86-89.

Solar Energy Research Institute. 1981. *A New Prosperity: Building a Sustainable Energy Future.* Brick House, Andover, Massachusetts.

BIBLIOGRAPHY

Southeastern Utah Association of Governments and Economic Development District. 1980. "The Documentation of the Community Attitude Survey January 1980" (unpublished document). Price, Utah.

Spencer, George B.; Echard, W. E.; Johnson, F. Sam. 1970. *Domestic Tar Sand and Potential Recovery Methods—A Review.*

State of Utah. 1982. *Uintah Basin Synfuels Development Draft Socio-economic Technical Report, Volume I.* August 1982. Prepared for the U.S. Department of the Interior, Bureau of Land Management by the Utah State Energy Office, Utah State Planning Coordinator's Office, and Utah State Department of Community and Economic Development. Salt Lake City, Utah.

State of Utah, Department of Health. 1978. *Wastewater Disposal Regulations, Standards of Quality for Waters of the State.* Division of Health, Salt Lake City, Utah.

State of Utah, Office of the Governor. 1984. "Comments on the Utah Combined Hydrocarbon Leasing Draft EIS" (personal communication). January 17, 1984. Salt Lake City, Utah.

Steward, Paul. 1983. "Colorado River Salinity Costs" (personal communication). August 22, 1983. U.S. Department of the Interior, Bureau of Reclamation. Durango, Colorado.

Swedish Ministry of Agriculture. 1982. "Report of the 1982 Stockholm Conference on Acidification of the Environment" (unpublished document). June 1982. Stockholm, Sweden.

System Applications, Inc. 1982. "Draft Air Quality Technical Report for the Uintah Basin Synfuels Development EIS" (unpublished document). August 1982. Prepared for U.S. Department of the Interior, Bureau of Land Management, Salt Lake City, Utah.

Thomas, J. W.; Maser, Chris; and Rodiek, Jon E. 1979. *Riparian Zones in Wildlife Habitats in Managed Rangelands—The Great Basin of Southeastern Oregon.* U.S. Department of Agriculture, Forest Service. Pacific Northwest Forest and Range Experiment Station. 18 pp.

Thomas, Margaret G. 1983. *Human Demographic Impacts on Fish and Wildlife Resources From Energy Development in Rural Western Areas.* September 1983. U.S. Department of the Interior, Fish and Wildlife Service. Washington, D.C. 357 pp.

Tripp, Bryce. 1984. "Tar Sand Quality and Grade Figures for the Special Tar Sand Areas Within Utah" (personal communication). March 29, 1984. Utah Geological and Mineral Survey, Salt Lake City, Utah.

Uintah Basin Association of Governments. 1979. *Uintah Basin Development Plan.* Roosevelt, Utah. 125 pp.

Uintex Corporation. 1981. "A Henry Mountain Resource Area Report, Part 1 and Part 2" (unpublished document). December 1981. U.S. Department of the Interior, Bureau of Land Management, Richfield District, Richfield, Utah.

University of Utah, Bureau of Community Development. 1979. *Garfield County, Utah, A Master Plan for Development.* Salt Lake City, Utah. 89 pp.

University of Utah, Bureau of Community Development. 1979. *Grand County, Utah, A Master Plan for Development.* October 1979. Salt Lake City, Utah. 131 pp.

U.S./Canada Working Group on Impact Assessment. 1981. "Report of the Working Group, U.S./Canada Memorandum of Intent on Transboundary Air Pollution" (unpublished document). February 1981.

U.S. Congress House Committee on Interstate and Foreign Commerce. 1980. *Powerplant Fuel Conservation Act of 1980. Hearings Before the Subcommittee on Energy and Power.* 96th Congress. Washington, D.C.

U.S. Congress, Office of Technology Assessment. 1980. *An Assessment of Oil Shale Technologies.* Washington, D.C.

U.S. Congress, Office of Technology Assessment. 1982a. *Energy Efficiency of Buildings in Cities.* Washington, D.C.

U.S. Congress, Office of Technology Assessment. 1982b. *Increased Automobile Fuel Efficiency and Synthetic Fuels: Alternatives for Reducing Oil Imports.* September 1982. Washington, D.C.

U.S. Congress, Senate. 1980. *Senate Reports Vol. 7. Nos. 784-824. Miscellaneous Reports.* 96th Congress, 2nd Session. Washington, D.C.

U.S. Congressional Budget Office. 1980. *Fuel Economy Standards for New Passenger Cars After 1985.* December 1980. Washington, D.C.

U.S. Congressional Budget Office. 1982. *Urban Transportation and Energy: The Potential Savings of Different Modes.* December 1977/August 1982. Washington, D.C.

U.S. Department of Agriculture, Forest Service. 1979a. *User Guide to Vegetation, Mining, and Reclamation in the West.* November 1979. Ogden, Utah. 85 pp.

U.S. Department of Agriculture, Forest Service. 1979b. "South Slope Land Use Plan" (unpublished document). Ashley National Forest, Vernal, Utah.

U.S. Department of Agriculture, Soil Conservation Service. 1975. *Soil Taxomony.* Agriculture Handbook No. 436. December 1975. U.S. Government Printing Office, Washington, D.C. 754 pp.

U.S. Department of Agriculture, Soil Conservation Service. 1979. *Soil Descriptions and Interpretations of Portions of Duchesne and Uintah Counties' Soil Survey Area, Utah.* June 1979. Salt Lake City, Utah.

U.S. Department of Agriculture, Soil Conservation Service. 1980. *Soil Survey—Range Creek Portion of Carbon Area, Carbon County, Utah.* April 1980. Salt Lake City, Utah.

U.S. Department of Agriculture, Soil Conservation Service and U.S. Department of the Interior, Bureau of Land Management. 1979. *Ashley Creek, Duchesne, Soil Inventory.* June 1979. Utah Agricultural Experiment Station. Logan, Utah.

U.S. Department of Agriculture, Soil Conservation Service and U.S. Department of the Interior, Bureau of Land Management. 1982a. *Draft Soil Survey Manuscript Carbon and Emery County Area.* Salt Lake City, Utah.

U.S. Department of Agriculture, Soil Conservation Service and U.S. Department of the Interior, Bureau of Land Management. 1982b. *Draft Soil Survey Manuscript Grand County Central Part.* Salt Lake City, Utah.

U.S. Department of Agriculture, Soil Conservation Service and U.S. Department of the Interior, Bureau of Land Management. 1982c. *Book Cliffs Soil Inventory.* Utah Agricultural Experiment Station. Logan, Utah.

U.S. Department of Agriculture, Soil Conservation Service and U.S. Department of the Interior, Bureau of Land Management. 1983. *Draft Soil Survey Manuscript San Juan Central Part.* Salt Lake City, Utah.

U.S. Department of Commerce, Bureau of the Census. 1982. *1980 Census of Population: Number of Inhabitants, Utah.* Government Printing Office, Washington, D.C.

U.S. Department of Commerce, Bureau of the Census. 1983. *Statistical Abstract of the United States 103rd Edition 1982-1983.* March 1983. U.S. Government Printing Office, Washington, D.C.

U.S. Department of Commerce, Bureau of Economic Analysis. 1982. *Regional Economics Information System.* Government Printing Office, Washington, D.C.

BIBLIOGRAPHY

U.S. Department of Energy, Buildings Division. 1981. *Building Energy Use Compilation and Analysis, Part C, Conservation Progress in Retrofitted Commercial Buildings.* Revised August 1981. Washington, D.C.

U.S. Department of Energy, Energy Information Administration. 1982. *Short Term Energy Outlook, Vol. 1—Quarterly Projections.* November 1982. Washington, D.C.

U.S. Department of Energy, Energy Information Administration. 1983. *Short Term Energy Outlook, Quarterly Projections.* February 1983. Washington, D.C.

U.S. Department of the Interior. 1979a. *Synthetic Fuels Development—Earth Science Consideration.* Library of Congress. Washington, D.C. 45 pp.

U.S. Department of the Interior. 1983. *Quality of Water—Colorado River Basin Progress Report No. 11.* January 19, 1983. Washington, D.C. pp. 47-48.

U.S. Department of the Interior, Bureau of Land Management. 1980. *BLM Facts and Figures for Utah 1980.* Salt Lake City, Utah. 48 pp.

U.S. Department of the Interior, Bureau of Land Management. 1981a. *Moon Lake Power Plant Project Units 1 and 2, Draft Environmental Impact Statement.* January 8, 1981. Richfield District Office, Richfield, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1981b. *Rocky Mountain Pipeline Project, Final Environmental Impact Statement.* December 1981. U.S. Government Printing Office, Denver, Colorado.

U.S. Department of the Interior, Bureau of Land Management. 1982a. *Environmental Assessments of the Regulations on Combined Hydrocarbon Leasing: Conversion of Existing Oil and Gas Leases and Valid Mining Claims.* January 1982. Salt Lake City, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1982b. *Environmental Assessments of the Regulations on Combined Hydrocarbon Leasing: Competitive Leasing.* April 1982. Salt Lake City, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1982c. *Energy Analysis Handbook for Preparation of Oil Shale Development Environmental Impact Statements.* March 1982. Colorado State Office, Denver, Colorado.

U.S. Department of the Interior, Bureau of Land Management. 1983a. "Rationale and Data Sources for Determining Alternative Production Levels for Special Tar Sand Areas in Utah" (unpublished document). March 1983. Richfield District Office, Richfield, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1983b. *Sunnyside Combined Hydrocarbon Lease Conversion Draft EIS.* October 1983. U.S. Government Printing Office, Denver, Colorado.

U.S. Department of the Interior, Bureau of Land Management. 1983c. "Fisheries Within Special Tar Sand Areas" (unpublished document). August 30, 1983. Richfield, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1983d. "Fisheries Outside Special Tar Sand Area Boundaries (Potential Water Sources)" (unpublished document). August 30, 1983. Richfield, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1983e. "Hydrocarbon Leasing Category Amendments to Management Framework Plans" (unpublished document). Moab, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1983f. "Acreage, Location, and Leasing Data for Special Tar Sand Areas Within Utah" (unpublished document). Utah State Office, Salt Lake City, Utah.

U.S. Department of the Interior, Bureau of Land Management. 1983g. *Uintah Basin Synfuels Development Final EIS.* Volume I. February 1983. U.S. Government Printing Office. Denver, Colorado.

U.S. Department of the Interior, Bureau of Land Management. 1984. "Definitions of Surface Mining and Related Reclamation Measures." January 30, 1984. U.S. Department of the Interior, Bureau of Land Management, Moab District Office. Moab, Utah.

U.S. Department of the Interior, Bureau of Land Management and U.S. Department of the Interior, National Park Service. 1983. "Site-Specific Analyses for Special Tar Sand Areas" (unpublished documents). Richfield District Office, Richfield, Utah.

U.S. Department of the Interior, Bureau of Reclamation. 1975. *Salinity and Sediment Study, Upper Colorado River Basin, Utah, Colorado, Wyoming.* June 1975. Salt Lake City, Utah.

U.S. Department of the Interior, Fish and Wildlife Service. 1979. *Humpback Chub Recovery Plan.* August 22, 1979. Colorado River Fisheries Recovery Team. 69 pp.

U.S. Department of the Interior, Fish and Wildlife Service. 1982. "Biological Opinion—White River Dam Project, Utah" (unpublished document). February 24, 1982. 16 pp.

U.S. Department of the Interior, Fish and Wildlife Service. 1983. "Threatened, Endangered, and Sensitive Species in Special Tar Sand Areas" (personal communication). June 13, 1983. Salt Lake City, Utah.

U.S. Department of the Interior, Geological Survey. 1983. *Potential Hydrologic Impacts of a Tar Sand Industry in 11 Special Tar Sand Areas in Eastern Utah.* Reston, Virginia.

U.S. Department of the Interior, Minerals Management Service. 1980. "Utah Tar Sand Leasing Minutes 1-13." *Federal Register* Notice. U.S. Government Printing Office, Washington, D.C.

U.S. Department of the Interior, Minerals Management Service. 1982. "Summary of Tract Delineation for Combined Hydrocarbon Leasing as of October 25, 1982" (personal communication). October 26, 1982. Salt Lake City, Utah. 4 pp.

U.S. Department of the Interior, National Park Service. 1977. *General Management Plan, Wilderness Proposal, Road Study Alternatives, and Draft Environmental Statement, Glen Canyon National Recreation Area.* U.S. Government Printing Office, Washington, D.C. 389 pp.

U.S. Department of the Interior, National Park Service. 1982. *The Nationwide River Inventory.* January 1982. Washington, D.C.

U.S. Department of the Interior, National Park Service. 1984. *Unit Plan of Operations for Tar Sand Triangle Combined Hydrocarbon Leasing Conversion Draft EIS* (unpublished document). Denver, Colorado.

U.S. Department of the Interior, Office of the Solicitor. 1983. "Wilderness Study Areas and Rights Under the Combined Hydrocarbon Leasing Act of 1981" (personal communication). May 22, 1983. Washington, D.C. 6 pp.

U.S. Department of Transportation. 1978. "Environmental Assessment Techniques" (unpublished document). Washington, D.C. pp. 41-43.

Utah Bureau of Air Quality. 1982. "1981 Utah Emissions Inventory" (unpublished document). Salt Lake City, Utah.

Utah Department of Employment Security. 1980. *Annual Reports.* Salt Lake City, Utah.

Utah Department of Employment Security. 1983. *Selected Annual Reports (1970-1980).* Salt Lake City, Utah.

Utah Department of Natural Resources, Outdoor Recreation Agency. 1980. *Utah Outdoor Recreation Plan 1980 (SCORP).* Salt Lake City, Utah. p. 157.

BIBLIOGRAPHY

Utah Department of Transportation. 1982. "Traffic on Utah Highways—1981." Transportation Planning Division, Travel Analysis Unit. Salt Lake City, Utah. 117 pp.

Utah Division of Wildlife Resources. 1982. *The 1982 Utah Big Game Investigations and Management Recommendations Book.* May 27, 1982. Volume 82-3.

Utah Geological and Mineral Survey. 1983. *Energy Resources Map of Utah.* Map 68. May 1983. Salt Lake City, Utah.

Utah Office of the Governor. 1983. "Nuclear Waste Repository Visitor Survey, Canyonlands National Park, Utah" (unpublished document). July 22, 1983. Salt Lake City, Utah.

Utah Office of the State Planning Coordinator. 1983. "Socioeconomic Data for Carbon and Emery Counties" (unpublished document). July 1983. Salt Lake City, Utah.

Utah State Energy Office. 1983. "Final Socioeconomic Technical Report, Uinta Basin Synfuels Development" (unpublished document). February 1983. Salt Lake City, Utah.

Wall Street Journal. 1983. "Vanpools Gain Despite Drop in Gas Prices" (news item). April 29, 1983. New York, New York. p. 27.

Weber, Dr. James. 1983. "Vegetation Disturbance on Surface Mining Versus In-situ Development" (personal communication). May 3, 1983. University of Wyoming Research Corporation. Laramie, Wyoming.

Western Division of American Fisheries Society (WDAFS). 1982. "The Best Management Practices for the Management and Protection of Western Riparian Stream Ecosystems" (unpublished document). August 1982. Riparian Habitat Committee and its Best Management Practices Subcommittee. Tualatin, Oregon. 45 pp.

Wilson, L.; Olsen, M. E.; Hutching, T. B.; Southard, A. R.; and Erickson, A. J. 1975. *Soils of Utah.* Bulletin 492. March 1975. Utah State University, Agricultural Experiment Station and U.S. Department of Agriculture, Soil Conservation Service. Logan, Utah. 94 pp.

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